The PHOTOFACT Servicer

SET 427 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN. 1, 1959

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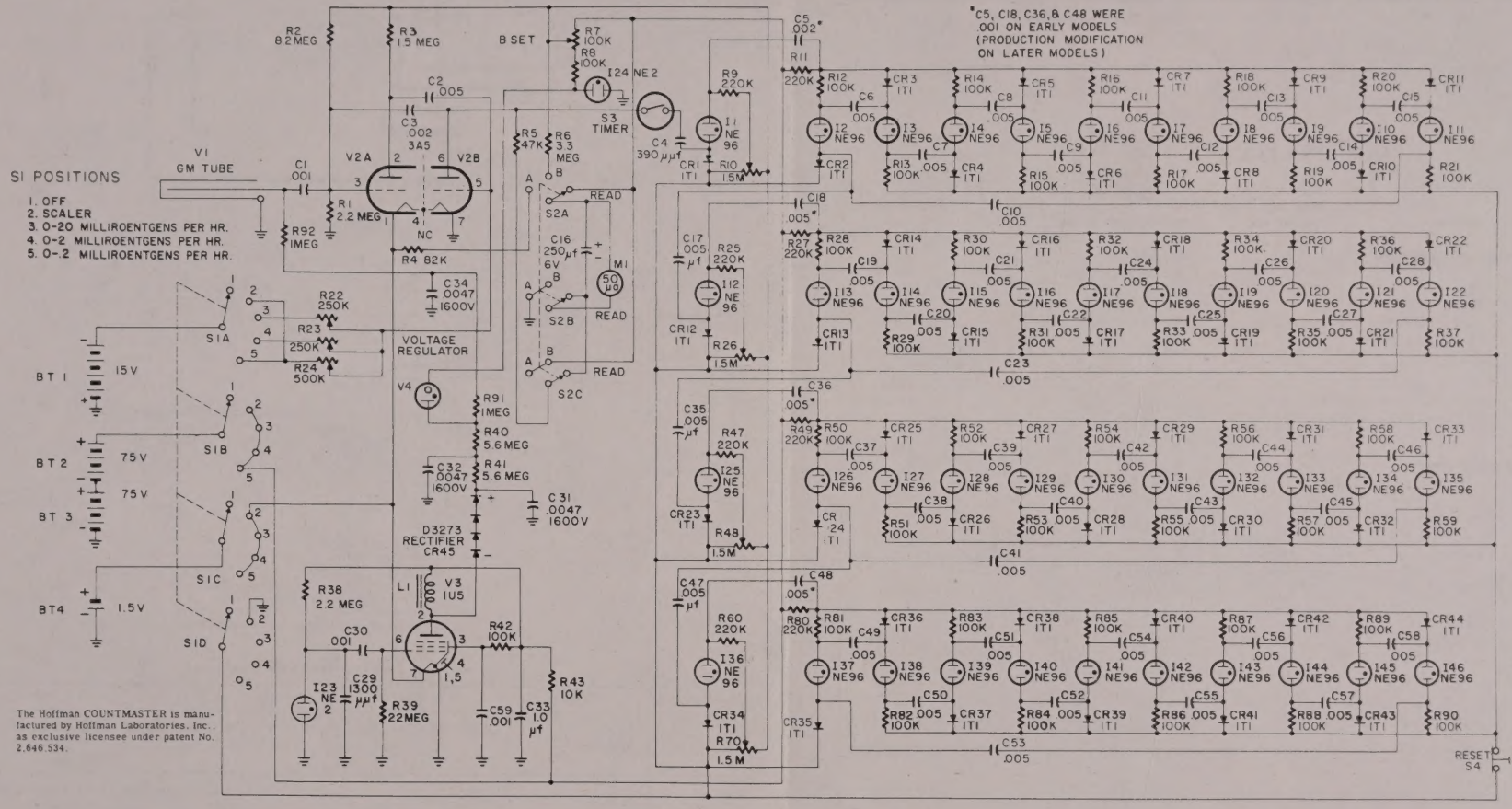
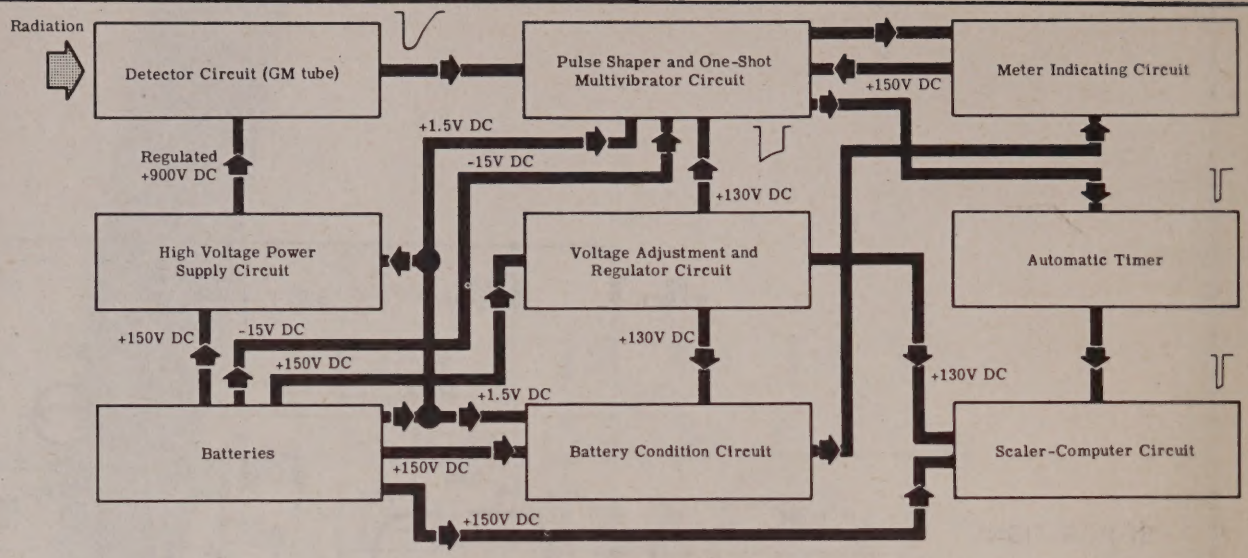
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.



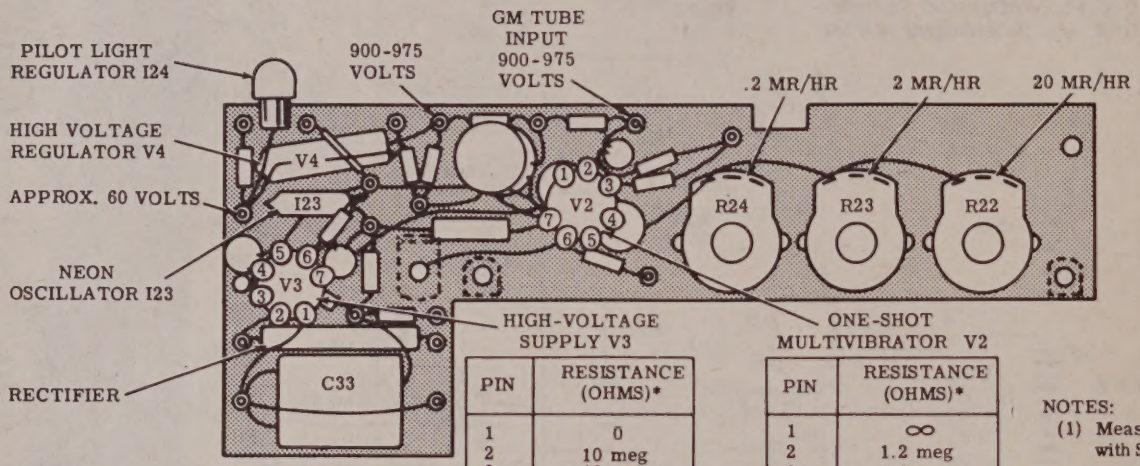
The Hoffman COUNTMASTER is manufactured by Hoffman Laboratories, Inc., as exclusive licensee under patent No. 2,646,534.

HOFFMAN COUNTMASTER
MODEL 216-1

Schematic Diagram Courtesy of HOFFMAN ELECTRONICS CORP.



Countmaster Block Diagram



PIN	RESISTANCE (OHMS)*
1	0
2	10 meg
3	10 meg
4	∞
5	0
6	22 meg
7	∞

PIN	RESISTANCE (OHMS)*
1	∞
2	1.2 meg
3	2.2 meg
4	∞
5	∞
6	10 meg
7	0

*Measure from tube side of socket to chassis ground -- with tube removed.

CAUTION: Make resistance measurements with MR/HR switch in OFF position.

NOTES:
(1) Measurements made with Simpson 260 meter.
(2) Read switch in the READ position.

Voltage and Resistance Measurements

Tube and Neon Bulb Complement

Quantity	Type	Function
1	CK1021 or 6530	Geiger-Mueller Tube
1	CK1038 or 5841	High Voltage Regulator
1	3A5	One-Shot Multivibrator
1	1U5	High Voltage Supply
1	D-3273	High Voltage Regulator

Quantity	Type	Function
1	NE2 Neon Bulb	High Voltage Supply Oscillator (Relaxation Oscillator)
1	NE2A Neon Bulb	Pilot Lamp and Voltage Regulator
40	*NE96 Neon Bulb	Scaler-Computer Indicators
4	*NE96 Neon Bulb	Decade Trigger Bulbs

PHOTOFACT* Folder

with CIRCUITRACE*

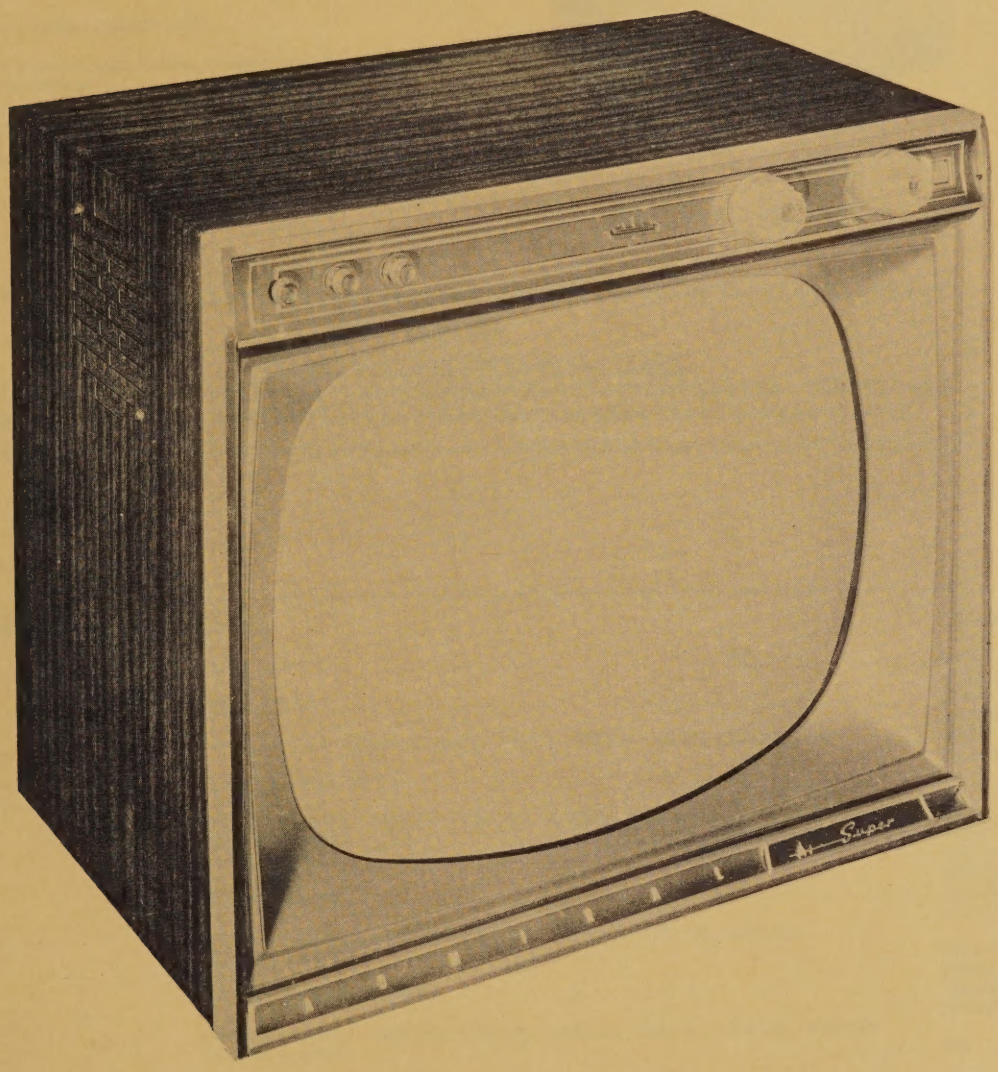
ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1



MODEL T21UG12 (Ch. 18UB6T)

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

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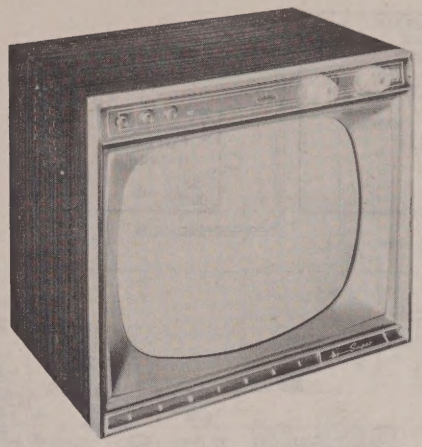
PHOTOFACT* Folder with CIRCUITRACE*

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove rear cover by sliding retaining clips inward.
2. Remove speaker leads.
3. Remove 5 bottom chassis bolts.
4. Remove 4 metal bolts holding chassis support brackets at rear of cabinet.
5. Remove chassis from front of cabinet.



MODEL T21UG12 (Ch. 18UB6T)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Admiral	MODELS	CHASSIS
		C21G2, C21G3	18A6C
			18A6CB
		T21G1, T21G2	18A6T
			18A6TB
		C21G12, C21G13, C21G14, C21G22, C21G23, C21G24, L21G12, L21G13, L21G14	18B6C
			18B6CB
		T21G11, T21G12, T21G13	18B6T
			18B6TB
		CS21G62, CS21G63, CS21G64, LS21G42, LS21G43, LS21G44	18C6C
		TS21G22, TS21G23	18C6T
		C21UG2, C21UG3	18UA6C
			18UA6CB
		T21UG1, T21UG2	18UA6T
			18UA6TB
		C21UG12, C21UG13, C21UG14, C21UG22, C21UG23, C21UG24, L21UG12, L21UG13, L21UG14	18UB6C
			18UB6CB
		T21UG11, T21UG12, T21UG13	18UB6T
			18UB6TB
		CS21G62, CS21G63, CS21G64, LS21G42, LS21G43, LS21G44, TS21G22, TS21G23 (Remote Control)	8R1

MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TUBES	VHF - Seventeen, UHF - Eighteen, Remote Chassis - Eight
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 215 Watts, 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD LOCATED ON PAGE 13

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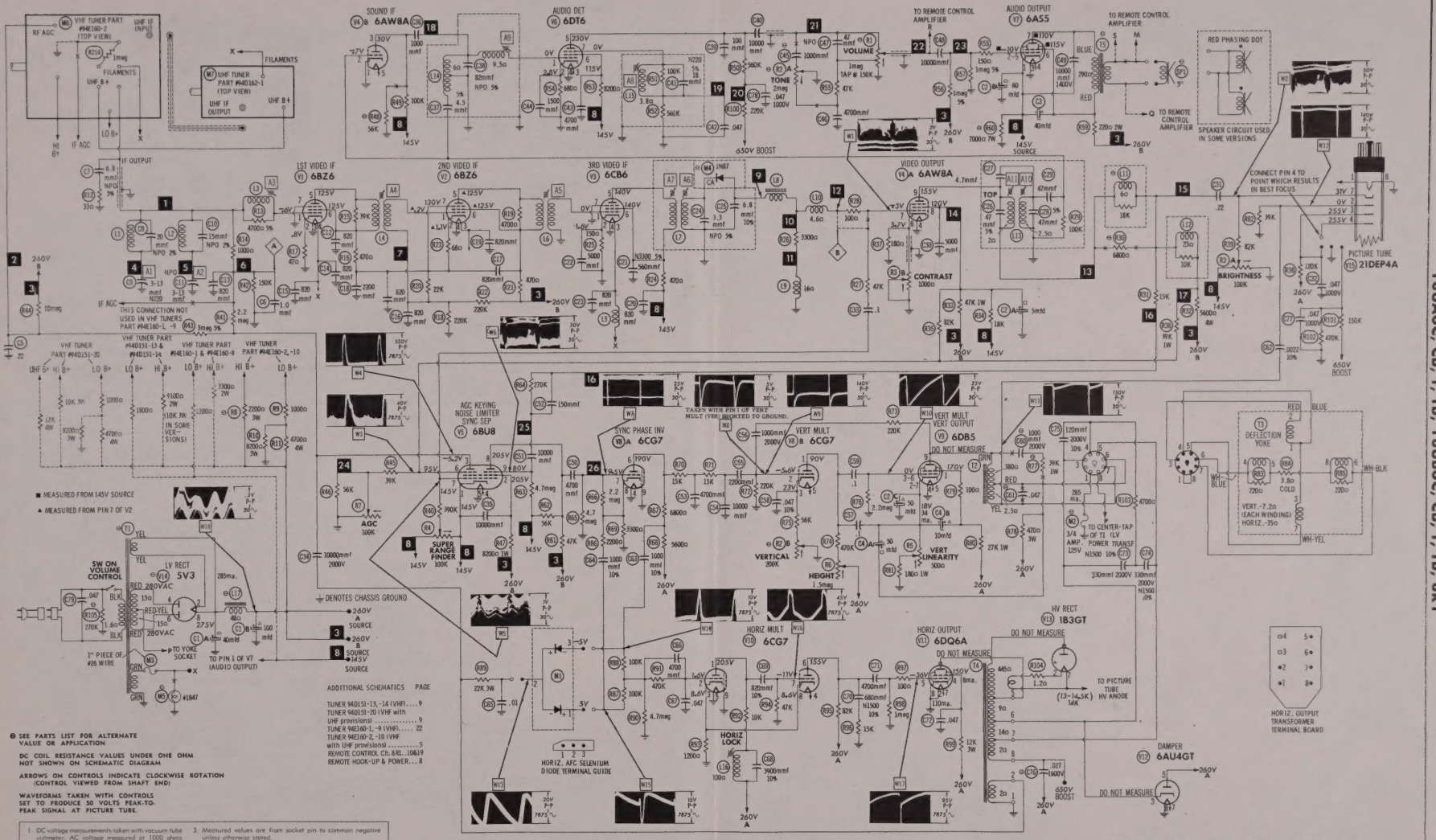
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H929

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1
SET 427 FOLDER 1


SOUND IF V4 B 6AW8A
AUDIO DET V6 6DT6
AUDIO OUTPUT V7 6AS5
TO REMOTE CONTROL AMPLIFIER
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4 A 6AW8A
VOLUME
TONE
CONTRAST
BRIGHTNESS
SPEAKER CIRCUIT USED IN SOME VERSIONS
RED PHASING DOT
CONNECT PIN 4 TO POINT WHICH RESULTS IN BEST FOCUS
PICTURE TUBE V15 21DEP4A
650V BOOST
IF OUTPUT
IF AGC
THIS CONNECTION NOT USED IN VHF TUNERS PART #94E160-L -9
VHF TUNER PART #94D151-13 & #94D151-14
VHF TUNER PART #94E160-1 & #94E160-9
VHF TUNER PART #94E160-2, -10
ACC KEYING NOISE LIMITER SYNC SEP V5 6BU8
SYNC PHASE INV V8 A 6CG7
VERT MULT V8 B 6CG7
VERT MULT VERT OUTPUT V9 6DB5
DO NOT MEASURE
AGC 100K
SUPER RANGE FINDER 100K
VERTICAL 200K
HEIGHT 1.5meg
VERT LINEARITY 500Ω
TO CENTER-TAP OF T1 (LV POWER TRANSF
3/4 AMP. 125V
T3 DEFLECTION YOKE
VERT.-7.2Ω (EACH WINDING)
HORIZ.-3Ω
SW ON VOLUME CONTROL
LV RECT 5V3 V14
TO YOKE SOCKET
TO PIN 1 OF V7 (AUDIO OUTPUT)
1" PIECE OF #26 WIRE
#1847
DENOTES CHASSIS GROUND
260V A SOURCE
260V B SOURCE
145V SOURCE
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
HORIZ MULT V10 6CG7
HORIZ OUTPUT V11 6DQ6A
HV RECT V13 1B3GT
HORIZ LOCK
TO PICTURE TUBE HV ANODE
(13-14.5K) 14K
DAMPER V12 6AU4GT
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
MEASURED FROM 145V SOURCE
MEASURED FROM PIN 7 OF V2
TAKEN WITH PIN 1 OF VERT MULT (V8B) GROUNDED TO GROUND.
ADDITIONAL SCHEMATICS PAGE
TUNER 94D151-13, -14 (VHF).... 9
TUNER 94D151-20 (VHF with UHF provisions) 9
TUNER 94E160-1, -9 (VHF).... 22
TUNER 94E160-2, -10 (VHF with UHF provisions) 5
REMOTE CONTROL Ch. 8 RL...10&19
REMOTE HOOK-UP & POWER.... 8
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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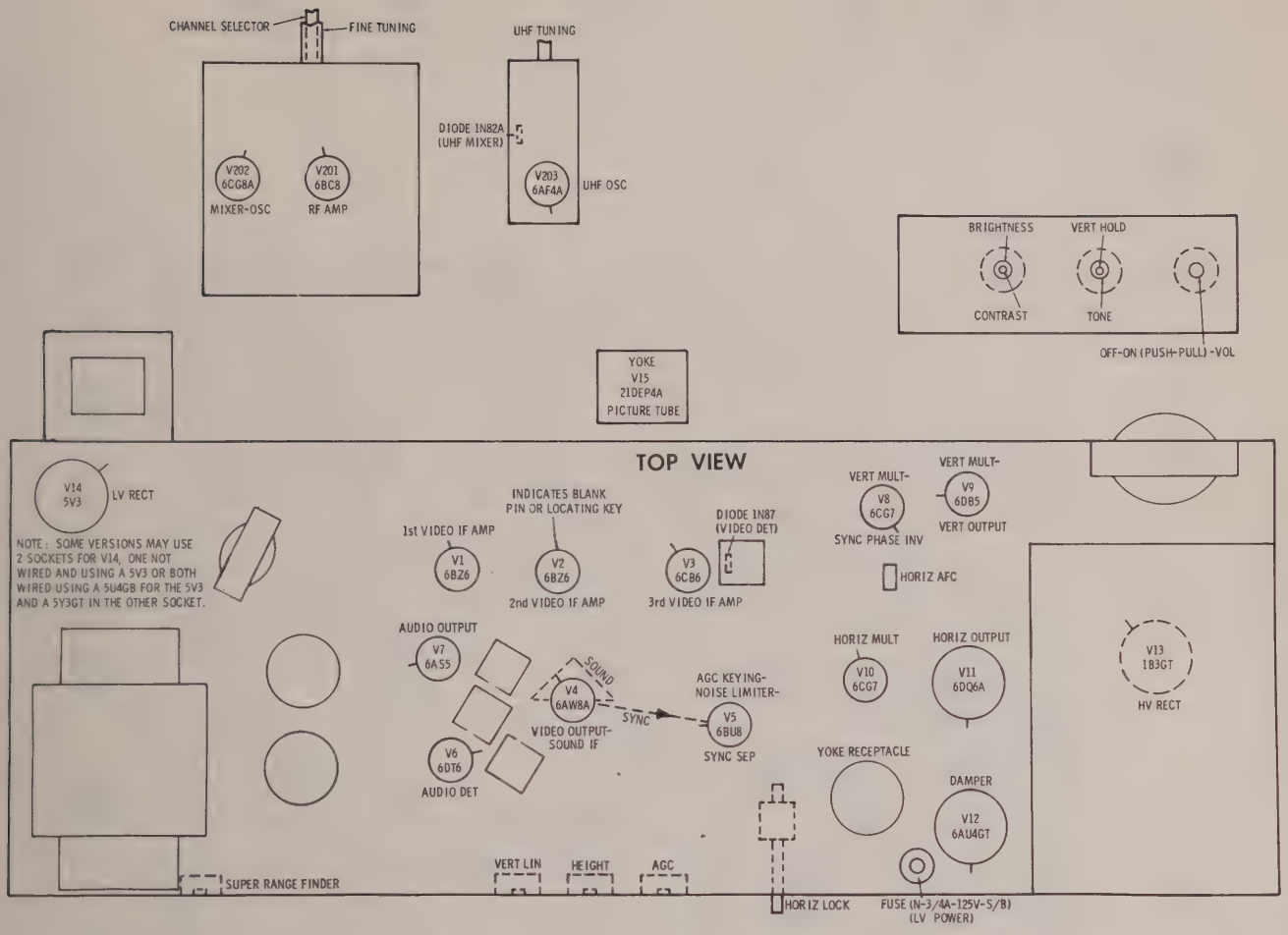
ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

FOLDER 1

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

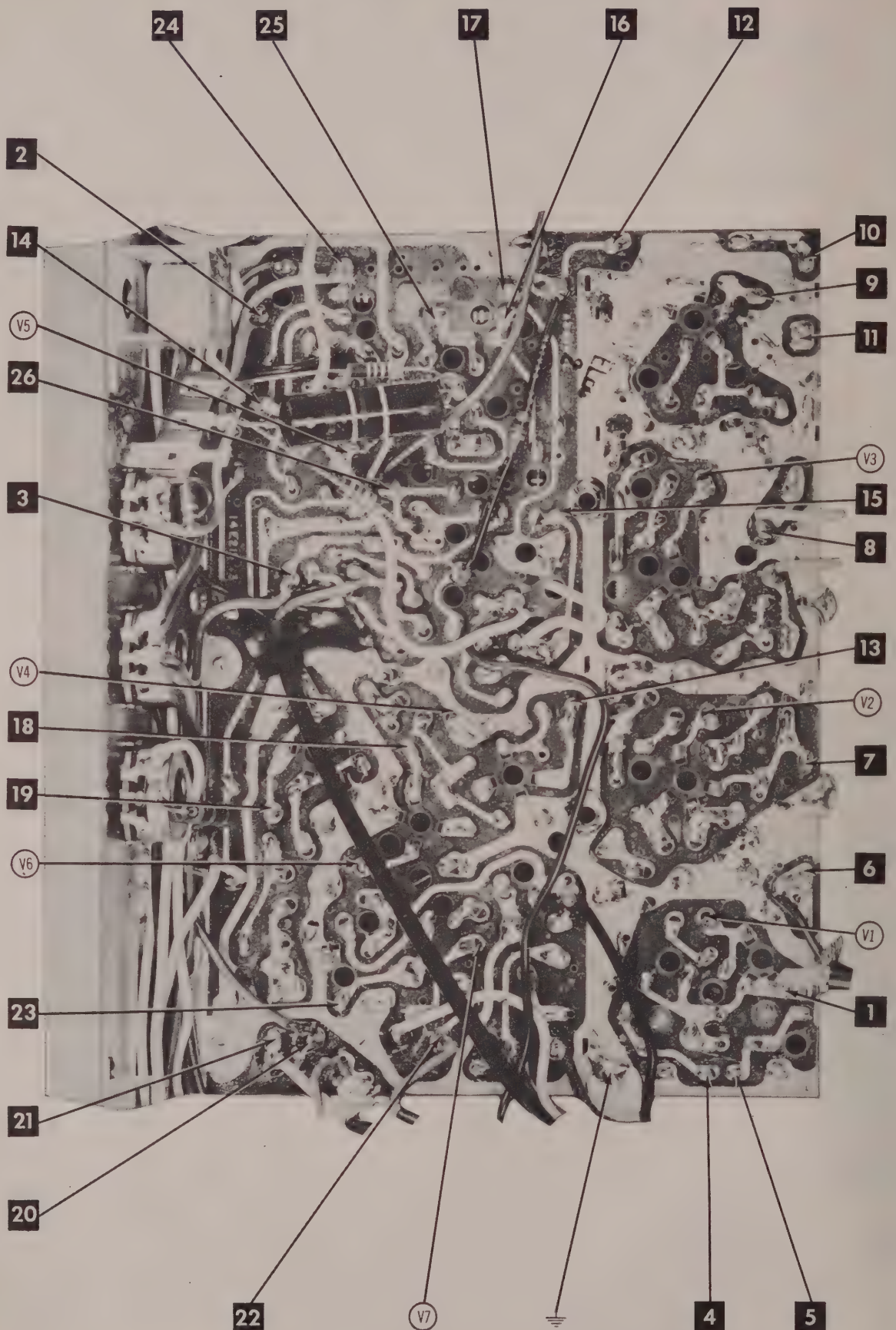
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Fuse (L. V. Power), V14, V7

SWEEP FAILURE
No raster, has sound - Rectifier (Horiz AFC), V10, V11, V12, V13, V15
No vertical deflection - V8, V9
Poor vert. linearity or foldover - V8, V9
Poor horiz. linearity or foldover - V10, V11, V12
Narrow picture - V10, V11, V12, V14
Vert. off freq. - V8, V9
Horiz. off freq. - V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V1, V2, V3, Diode (Video Det.), V4, V7
No pic, no sound, has snow - V201, V202, V1 (V203 UHF)
No pic, has sound, has raster - V4, V15
Has pic, no sound - V4, V6, V7
Overloaded picture - V5, V7

SYNC FAILURE
No vert. sync - V5, V8, V7
No horiz. sync - V5, V8, V7, Rectifier (Horiz AFC)
No vert. or horiz. sync - V5, V8, V7

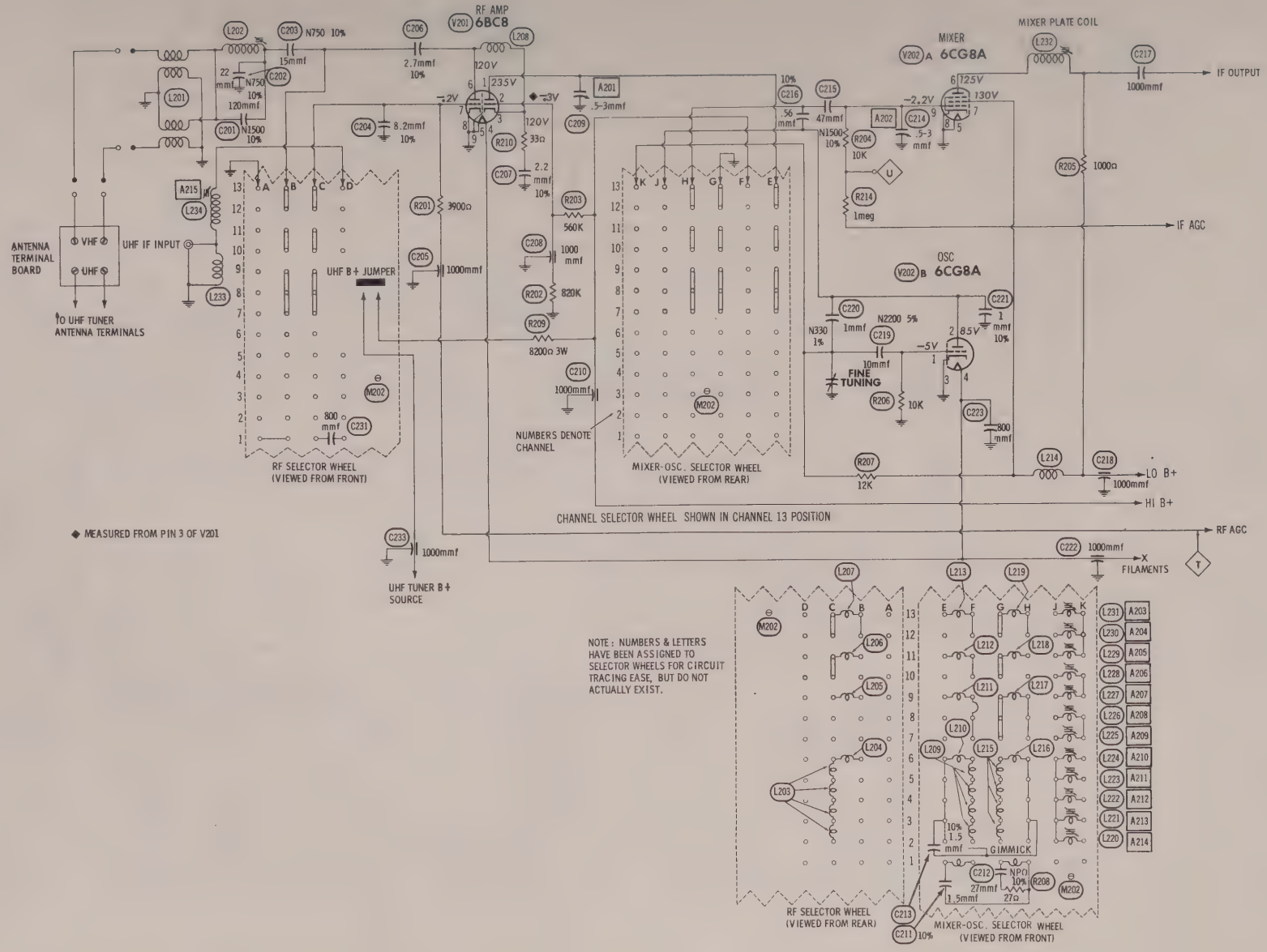


A Howard W. Sams CIRCUITRACE* Photo

*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



SET 427 FOLDER 1

PAGE 5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER WITH UHF PROVISIONS 94E160-2, -10

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1

FOLDER 1

TUNER PARTS LIST AND DESCRIPTIONS

94D160-2, 94D162-1

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BC8	
V202	Mixer-Osc.	6CG8A	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	6AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		65D10-136						N1500 10%
C202	22		65D6-142	N750-SI 22	TCZ-22	CTA6Q22U	CN7-422	5TCU-Q22	N750 10%
C203	15		65D10-135	N750-DI 15	DTZ-15	CTA6Q15U	CN7-415	5TCU-Q15	N750 10%
C204	8.2		65B28-082	NPO-SI 8.2					10%
C205	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C206	2.7		65B28-027						10%
C207	2.2		65B28-022	NPO-SI 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	10%
C208	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C209	.5-3		66A38-9		829-3		CT565A		
C210	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C211	1.5		65B28-015	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C212	27		65D10-93			C10Q27C	CNO-427		NPO 10%
C213	1.5		65B28-015	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C214	.5-3		66A38-9		829-3		CT565A		
C215	47		65D10-180						N1500 10%
C216	.56		65B28-0056						10%
C217	1000		65D10-53	BPD-001	DD-102	BYA6D1	B-210	5HK-D1	
C218	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C219	10		65D10-160						N2200 5%
C220	1		65D6-141						N330 1%
C221	1		65B28-010	NPO-SI 1	TCZ-1			5TCCB-V1	10%
C222	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C223	800		65D10-20	BPD-0008	DD-801	L10T8		5GA-T8	
C224	.5			NPO-SI .5	TCZ-R5				
C225	.5			NPO-SI .5	TCZ-R5				
C226	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C227	.5-3				829-3		CT565A		
C228	135								
C229	1000			EF-001	MFT-1000			503C-D1	
C230	18								
C231	800		65D10-20	BPD-0008	DD-801	L10T8		5GA-T8	
C232	1000			EF-001	MFT-1000			503C-D1	
C233	1000			EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R201	3900Ω		60B8-392	
R202	820K		60B8-824	
R203	560K		60B8-564	
R204	10K		60B8-103	
R205	1000Ω		60B8-102	
R206	10K		60B8-103	
R207	12K		60B8-123	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R208	27Ω		60B8-270	
R209	8200Ω	3	61B24-347	
R210	33Ω		60B8-330	
R211	680K		60B8-684	
R212	5600Ω		60B8-562	
R213	100Ω		60B8-101	
R214	1meg		60B8-105	

COILS (RF-IF)

ITEM No.	USE	ADMIRAL PART No.	NOTES
L201	VHF Ant. Trans.	700B131	
L202	IF Trap Coil	73D30-43	
L203	Ant. Coils	73D30-12	Channel 2-5
L204	Ant. Coil	73D30-17	Channel 6
L205	"	73D30-18	Channel 7-9
L206	"	73D30-21	Channel 10-11
L207	"	73D30-40	Channel 12-13
L208	Cathode Choke	73D30-51	
L209	RF Coils	73D30-19	Channel 2-5
L210	RF Coil	73D30-27	Channel 6
L211	"	73D30-8	Channel 7-9
L212	"	73D30-5	Channel 10-11
L213	"	73D30-25	Channel 12-13
L214	RF Choke	73D30-29	
L215	Mixer Grid Coils	73D30-20	Channel 2-5
L216	Mixer Grid Coil	73D30-38	Channel 6
L217	"	73D30-45	Channel 7-9

ITEM No.	USE	ADMIRAL PART No.	NOTES
L218	Mixer Grid Coil	73D30-33	Channel 10-11
L219	"	73D30-31	Channel 12-13
L220	Osc. Coil	73D30-53	Channel 2
L221	"	73D30-53	Channel 3
L222	"	73D30-54	Channel 4
L223	"	73D30-59	Channel 5
L224	"	73D30-58	Channel 6
L225	"	73D30-9	Channel 7
L226	"	73D30-6	Channel 8
L227	"	73D30-60	Channel 9
L228	"	73D30-57	Channel 10
L229	"	73D30-57	Channel 11
L230	"	73D30-1	Channel 12
L231	"	73D30-32	Channel 13
L232	Mixer Plate Coil	73D30-44	
L233	RF Choke	73D30-42	
L234	UHF IF Coil	73D30-41	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M201	1N82A	94D112-57	1N82A	1N82A	UHF Mixer (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M202	Rotor Disc	A7201	Tuner 94E160-2
M203	Rotor Disc	A7209	Tuner 94E160-10

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS 94E160-1, -2, -9, -10

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools:
A201, A202 ..... General Cement #5000, 5003, 5009, 8276 or 8290
Walsco #2515, 2520, 2523, 2525 or 2537
A203 thru A214 ..... General Cement #8607, 9291 or 9294
Walsco #2520, 2522, 2523, 2524 or 2537
A215 ..... General Cement #5009, 8271, 8275, 8276, 8721, 8722, 9150 or 9298
Walsco #2516 or 2519

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓣ. Positive to chassis.
Turn Contrast fully clockwise.
Set AGC and Super Range Finder controls fully counterclockwise.
If separate marker generator is used, couple loosely to antenna terminals.
DO NOT remove the bottom shield of the tuner during alignment.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 15K to point Ⓤ. Low side to chassis.	A201, A202	Adjust for response curve similar to Fig. 201 with markers above 90%.
2.	"	"	85MC	83.25MC 87.75MC	6	"		Check for response curve similar to Fig. 201. Retouch A201 and A202 for maximum amplitude and flat-topped appearance with markers properly positioned.
3.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A203	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A204	
			201MC	199.25MC 203.75MC	11		A205	
			195MC	193.25MC 197.75MC	10		A206	
			189MC	187.25MC 191.75MC	9		A207	
			183MC	181.25MC 185.75MC	8		A208	
			177MC	175.25MC 179.75MC	7		A209	
			85MC	83.25MC 87.75MC	6		A210	
			79MC	77.25MC 81.75MC	5		A211	
			69MC	67.25MC 71.75MC	4		A212	
			63MC	61.25MC 65.75MC	3		A213	
			57MC	55.25MC 59.75MC	2		A214	

FIG. 201

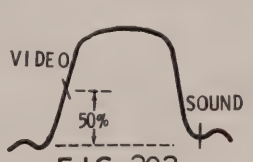


FIG. 202

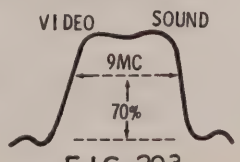


FIG. 203

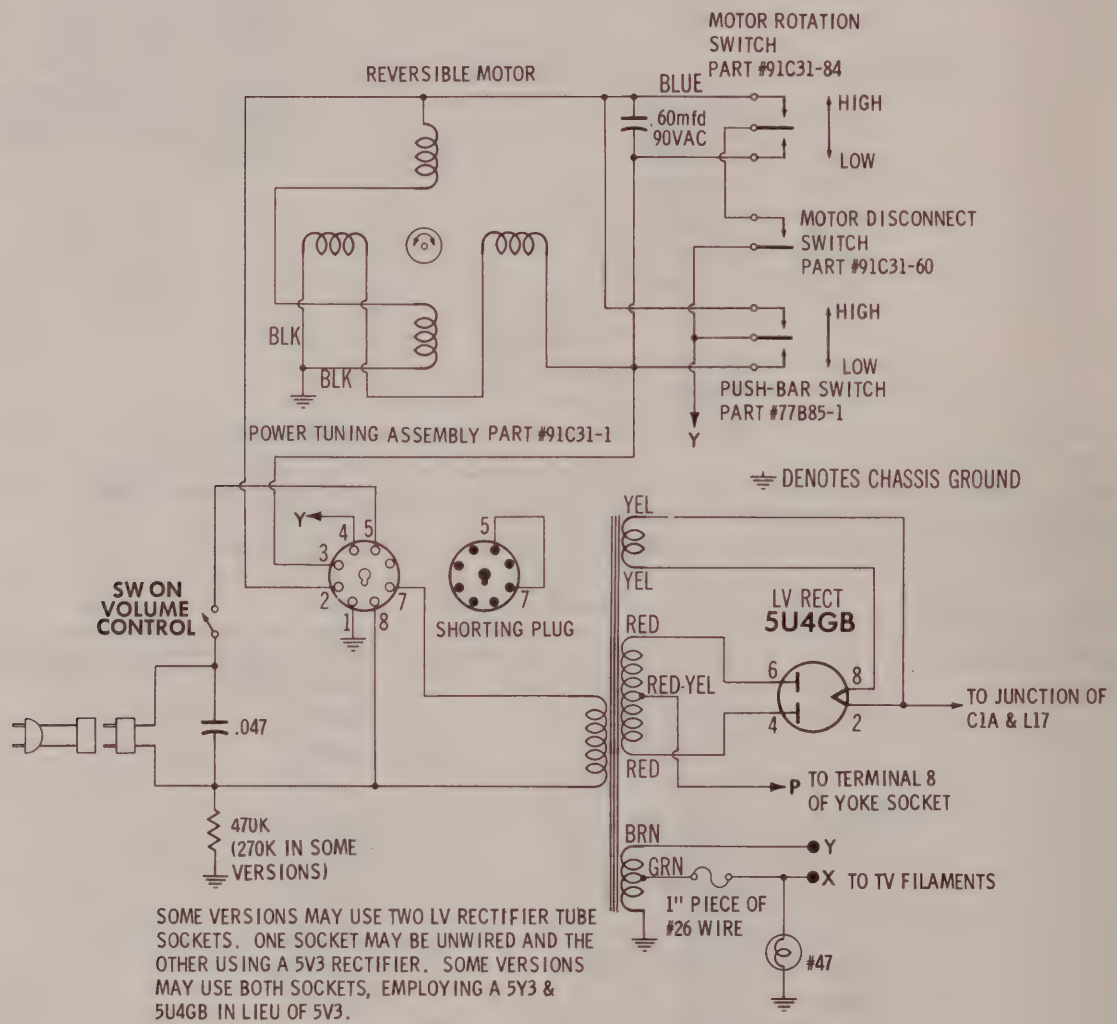
CONTINUED PAGE 8

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT FOR TUNERS 94F160-2, -10

Set Contrast fully clockwise.
Set AGC and Super Range Finder fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4 volt bias supply to point (T). Positive to chassis.
If a separate marker generator is used, couple loosely to UHF antenna terminals.
Bottom shield must be in place when checking response curve.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead. Loosely couple VHF marker generator to antenna terminals.	700MC (15MC Swp)	41.25MC 45.75MC	UHF 52	Vert. Amp. thru 10K to point (U). Low side to chassis.	A215	Adjust for maximum gain and symmetry of response similar to Fig. 203 with markers as shown.
6.	"	"	"	"	"	Vert. Amp. thru 47K to Video Det. load. Low side to chassis. Connect a 270mmf capacitor across input terminals of scope.		Check for response similar to Fig. 202. If necessary, make compromise adjustment of A215 to obtain desired response.



SOME VERSIONS MAY USE TWO LV RECTIFIER TUBE SOCKETS. ONE SOCKET MAY BE UNWIRED AND THE OTHER USING A 5V3 RECTIFIER. SOME VERSIONS MAY USE BOTH SOCKETS, EMPLOYING A 5Y3 & 5U4GB IN LIEU OF 5V3.

LV POWER SUPPLY & POWER TUNING MOTOR CIRCUIT USED IN CHASSIS WITH REMOTE CONTROL

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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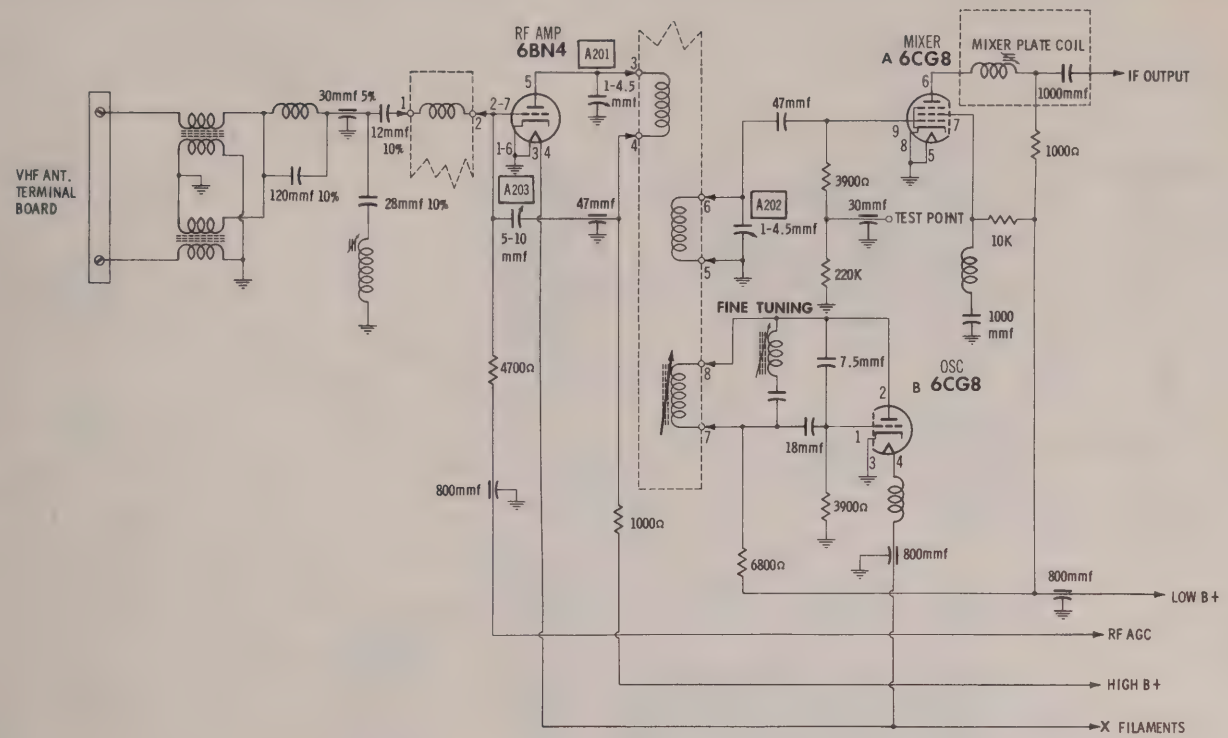
ALTERNATE SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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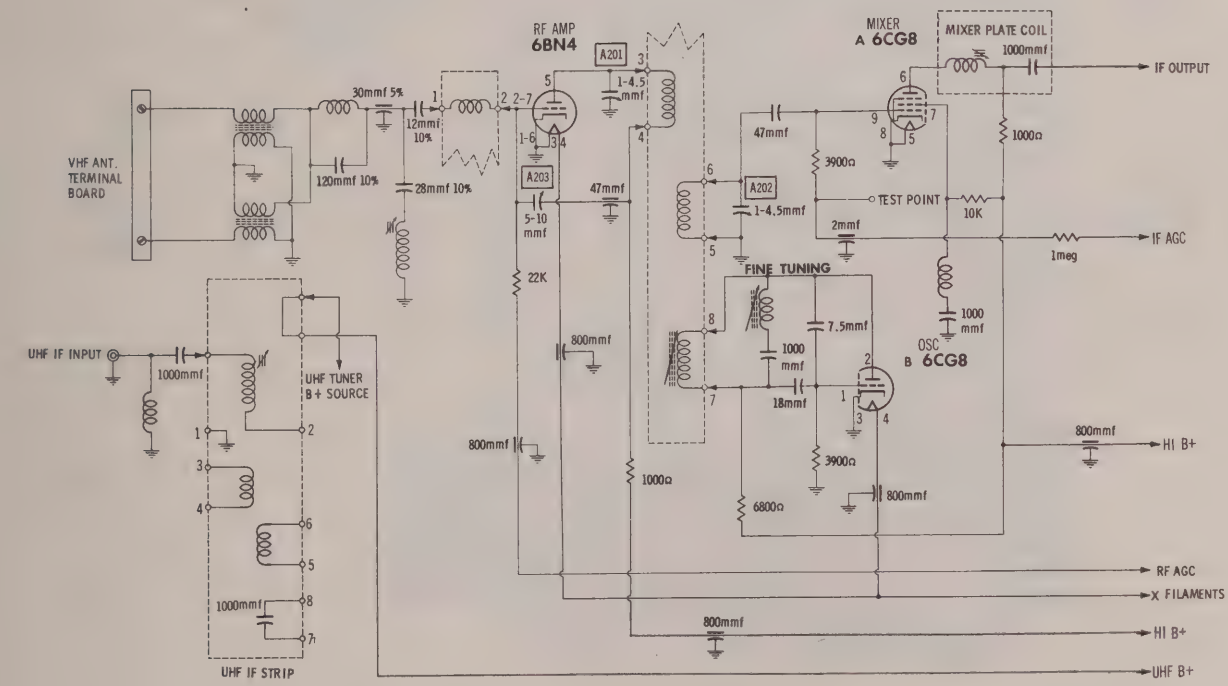
VHF TUNER 94D151-13, -14



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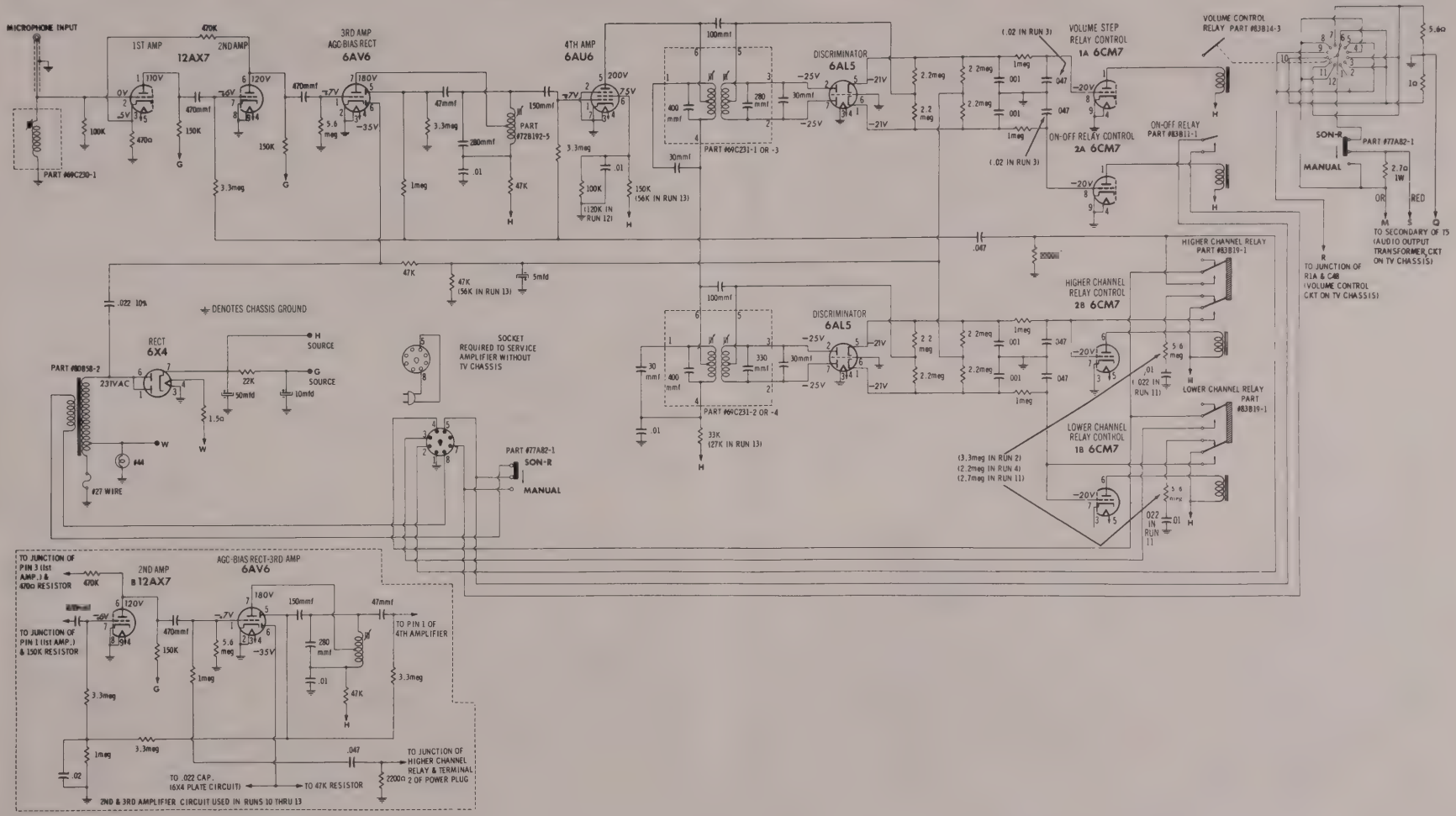
VHF TUNER WITH UHF PROVISIONS 94D151-20



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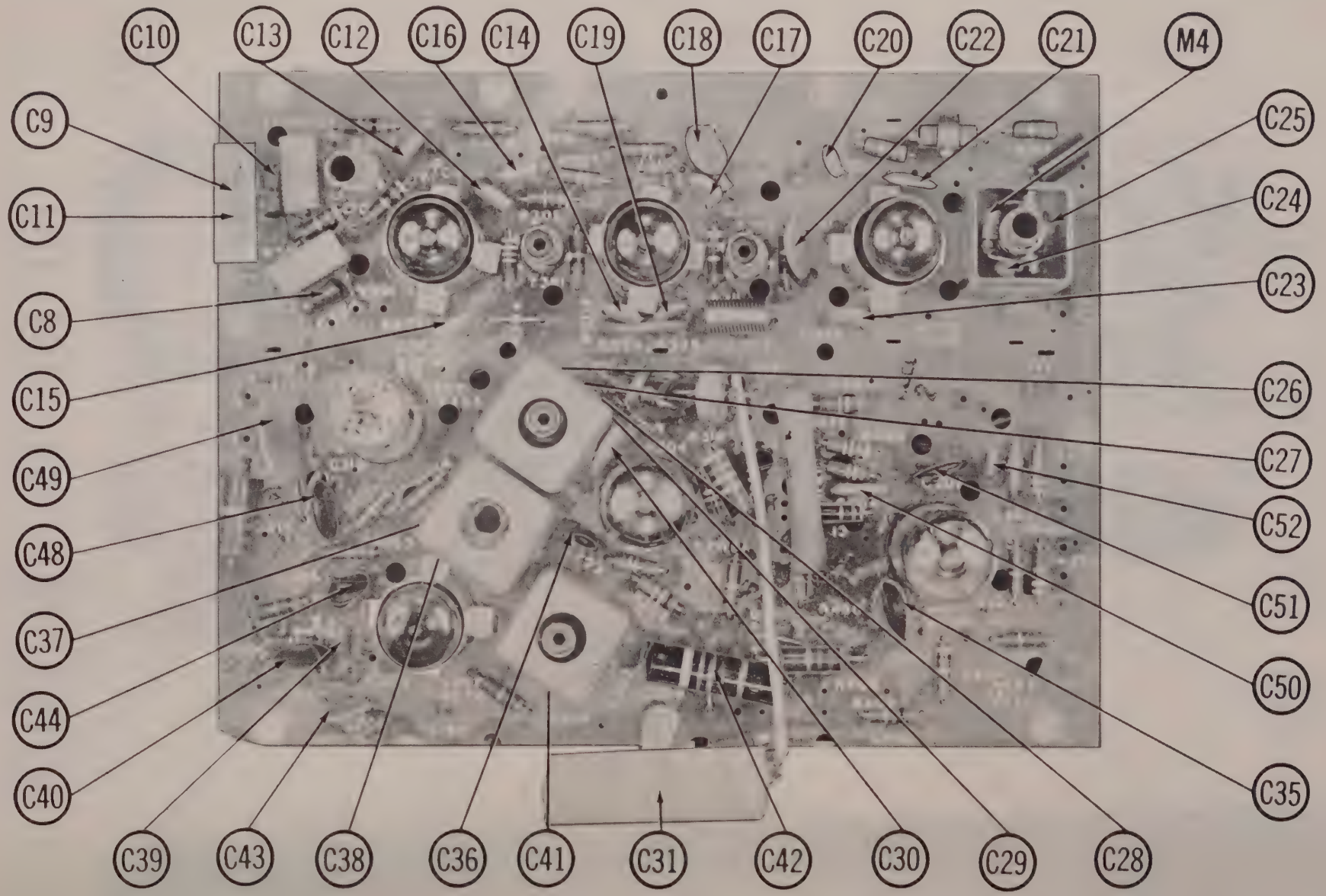
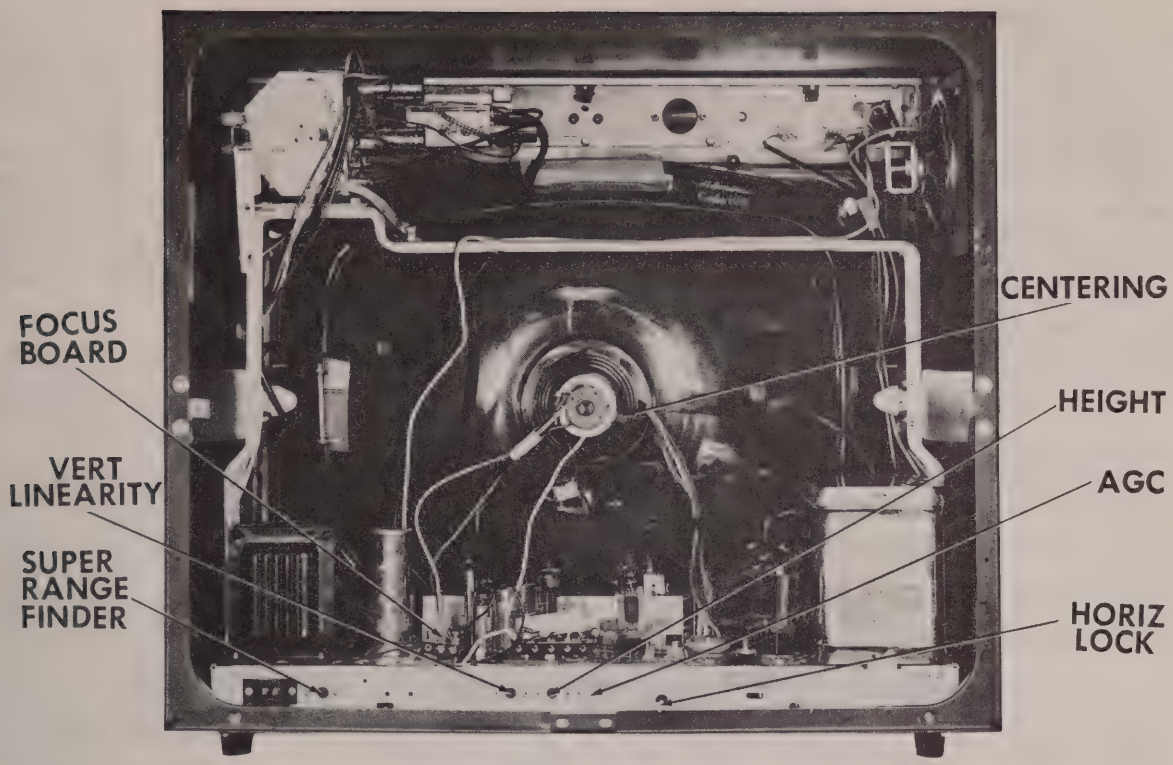
REMOTE CONTROL CHASSIS 8R1

CHASSIS TOP VIEW



PRINTED BOARD CAPACITOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a weak TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Lock clockwise until picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Lock slowly counterclockwise until the picture just falls into sync.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, as the Channel Selector is rotated. Adjust for best picture and sound.

SAFETY GLASS REMOVAL

Place middle finger of each hand under bottom safety glass metal trim and locate 2 metal projections about 6" from each end of trim. Place fingers between these projections and push up on metal trim vigorously until top flange of trim strip clears upper edge of glass retaining plate. Exert pressure with fingers away from glass so trim strip pivots outward. Remove 4 metal screws holding glass metal retainer. Remove safety glass by lifting bottom out and sliding down.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distors or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
The focus may be varied in steps by the position of a plug in the Focus Adjustment board.

C. Super Range Finder
The Super Range Finder control should be turned fully counterclockwise and left there if satisfactory pictures can be obtained in this position. Where the signal strength is weak, turn the control clockwise until the picture is satisfactory.

D. Width
No provision is made to vary the width on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The adjustment of the Horizontal Frequency coil is used as the Horizontal Lock control. Adjust the Horizontal Lock until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

A fuse is used for LV power supply protection and a fuse wire for filament protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	6BZ6	
V2	2nd Video IF Amp.	6BZ6	
V3	3rd Video IF Amp.	6CB6	
V4	Video Output-Sound IF	6AW8A	
V5	AGC Keying-Noise Limiter -Sync Sep.	6BU8	
V6	Audio Det.	6DT6	
V7	Audio Output	6AS5	
V8	Vert. Mult. -Sync Phase Inv.	6CG7	
V9	Vert. Mult. -Vert. Output	6DB5	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	6DQ6A	
V12	Damper	6AU4GT	
V13	HV Rect.	1B3GT	
V14	LV Rect.	5V3	Note 1

Note 1. Some versions may use 2 sockets for LV Rect., one not wired and using a 5V3 or both being wired using a 5U4GB for the 5V3 and a 5Y3GT in the other socket.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	21DEP4A	21DEP4 ①		21DEP4 ②	① "Aluminized" ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	ADMIRAL PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	≈40	350	67D15-333	AFH2-64-25	B0331	FP347	TMT-164	D-177	TVL-2638
B	≈100	350							
C2A	≈6	200	67D15-330						
B	≈60	200							
C	≈50	50							
C3	≈40	350	67B4-21	PRS250V40	BR4025	TC58	TD-40-350	MT-2540	TVA-1511
C4A	≈50	350	67D15-221	AFH3-26-30	C0225	FP330.7	TMT-205	S-220 MT-4510	
B	≈10	350							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
C5	.22	300	64B8-37	P288N-23		CUB2P23	GEM-3022	2TM-P22	
C6	1.0	100	64AI0-3	P288N-1.0		CUB2W1	GEM-21	2TM-M1	
C7	6.8		65D10-103		DTZ-6R8		CNO-568	5TCCB-V68S 5%*	NPO 5%
C8	30		65D6-139		TCZ-30			5TCCB-Q3S 5% *	NPO 5% N220
C9	3-16		66A38-7						
C10	15		65D6-140		TCZ-15			5TCCB-Q15S 5%*	NPO 5% NPO
C11	3-13		66A38-7						
C12	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C13	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C14	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C15	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C16	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C17	820		65D10-91	BPD-0008	DD-821	L10T82	B-362	5GA-T82	
C18	2200		65D10-70	DI-2200	DD-222	L10D22	B-322	5GA-D22	
C19	820		65D10-91	HVD-15-820	DD-821	L10T82	B-362	5GA-T82	
C20	820		65D10-91	HVD-15-820	DD-821	L10T82	B-362	5GA-T82	
C21	560		65D6-131						N3300 5%
C22	5000		65D10-5	DI-5000	DD-502	L10D5	B-350	5GA-D5	
C23	820		65D10-91	HVD-15-820	DD-821	L10T82	B-362	5GA-T82	
C24	3.3		65D6-89		TCZ-3R3	CTA5V33C		5TCCB-V33S 10%*	NPO 5%
C25	6.8		65B41-141	NPO-SI 6.8	TCZ-6R8	CTA5V68C	Z7-5568	5TCCB-V68S 10% *	NPO 10%
C26	47		65D10-93		DTZ-47		CNO-447	5GA-Q47S 5%*	5%
C27	4.7		65D2R-138	NPO-DI 4.7	DTZ-4.7	C10Y47C	CNO-547	10GAB-V47	
C28	47		65D10-92		DTZ-47		CNO-447	5GA-Q47S 5%*	5%
C29	47		65D10-80	DI-47	DD-470	L10Q47	CNO-447	5GA-Q47	
C30	5000		65D10-5	DI-5000	DD-502	L10D5	B-350	5GA-D5	
C31	.22	400	64B6-34	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C32	.047	1000	64B2-30	P1088N-047	DF-503	CUBI0647	GEM-10147	10TM-S47	
C33	.1	400	64B6-7	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C34	1000	2000	65D10-181	HVD-30-1000	DD-103	HVB20D1	2HV-S10	20GA-D1	
C35	10000		65D10-41	DI-10000	DD-103	BYA10S8	B-110	5GA-SI	
C36	1000		65D10-53	DI-1000	DD-102	L20D1	B-210	5GA-D1	
C37	4.5		65B40-57					5TCCB-V45S 5% *	5%
C38	82		65D10-95		DTZ-82		CNO-482	5TCCB-Q82S 5%*	NPO 5%
C39	100		65D10-84	DI-100	DD-101	L10T1	CNO-210	5GA-T1	
C40	10000		65D10-41	DI-10000	DD-103	BYA10S8	B-110	5GA-SI	
C41	18		65D10-140						N220 5%
C42	.047	200	64D8-41	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C43	4700		65D10-113	DI-4700	DD-472	L20D47	B-347	5GA-D47	
C44	1500		65D10-103	DI-1500	DD-152	L10D15	B-215	5GA-D15	
C45	1000		65D10-53	DI-1000	DD-102	L10D1	B-210	5GA-D1	①
C46	4700		65D10-113	DI-4700	DD-472	L20D47	B-347	5GA-D47	
C47	47		65D10-80	DPC-DI 47	DTZ-47	C10Q47C	CNO-447	5TCC-Q47	NPO
C48	10000		65D10-41	DI-10000	DD-103	BYA10S8	B-110	5GA-SI	
C49	10000	1400	65D10-65					2HV-S10	20HKB-SI
C50	4700		65D10-112	DI-4700	DD-472	L10D47	B-347	5GA-D47	
C51	10000		65D10-41	DI-10000	DD-103	BYA10S8	B-110	5GA-SI	
C52	150		65D10-85	DI-150	DD-151	L10T15	B-315	5GA-T15	
C53	4700		65D10-112	DI-4700	DD-472	L10D47	B-347	5GA-D47	
C54	10000		65D10-41	DI-10000	DD-103	BYA10S8	B-110	5GA-SI	
C55	2200		65D10-111	DI-2200	DD-222	L10D22	B-322	5GA-D22	
C56	1000	2000	65D10-181	DI-1000	DD-102	HVB20D1	2HV-S10	20GA-D1	
C57	.1	400	64B6-26	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C58	.047	600	64B22-9					5TM-S47S 10% *	10%
C59	.1	400	64B6-26	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C60	1000	3000	65D10-181	HVD-30-1000	D330-102	HVB30D1	3HV-S10	30GA-D1	④
C61	.047	600	64B6-9	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	④
C62	.0022	600	64B22-11					6TM-D22S 10%*	10%
C63	1000		65D10-181		-		B-210	5GA-D10S 10%*	10%
C64	1000		65D10-181				JL-210	5GA-D10S 10% *	10%
C65	.01	600	64B6-32	P688N-01	DD-103	CUB6S1	GEM-611	6TM-SI	
C66	4700		65D10-113	DI-4700	DD-472	L10D47	B-347	5GA-D47	
C67	.047	600	64B6-9	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C68	3900		65B22-392	1464-0039		1R5D39		MS-239	10%
C69	820		65B21-821	1469-00082		1R5T82		MS-382	10%
C70	680		65B21-681	1469-00068		1R5T68		MS-368	10%
C71	4700		65D10-112	DI-4700	DD-472	L10D47	B-347	5GA-D47	
C72	.047	600	64B6-9	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C73	330	2000	65D10-186						N1500 10%

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
C74	330	2000	65D10-186						N1500 10%
C75	120	2000	65D10-146						N1500 10%
C76	.027	1600	64B2-46					MP-S27S 10%*	10% ⑤
C77	.047	1000	64B6-28	P1088N-047	DF-503	CUB1S47	GEM-10147	10TM-S47	
C78	.047	1000	64B2-30	P1088N-047		CUBI0647	GEM-10147	10TM-S47	
C79	.047	600	63B12-1	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Not used in Ch. 18UA5 Series.
② Not used in chassis stamped Run 10 or 11.
③ Not used in chassis stamped Run 12 only.
④ Chassis stamped Run 10 thru 13 use .022mfd Ⓐ 1600V in this application (Part #64B2-43).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	75B44-2					Volume, Tap Ⓐ 150K, Note 1
B	Shaft							
C	Switch							
R2A	2meg	½	75B17-33	F1-68	RTV-671	‡≈ QJ-964	†† UZE3908	Tone, Note 2
B	200K	½		R2-33	Not Req.			Vert. Note 2
R3A	100K	½	75B17-31	F1-31	RTV-673	‡ • QJ-965	‡‡ UZE3909	Brightness
B	1000Ω	½		R2-5	Not Req.			Contrast
R4A	100K	½	75D20-116	AB-40	B47-100K-S	B11-138	PTA15L	Super Range Finder
B	Shaft			AK-1	Not Req.	TM1-K11	Not Req.	
R5A	500Ω	½	75D20-100	AB-4	B47-500-S	QJ1-103	PTA25L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	1.5meg	½	75D20-104	AB-742	B47-1.5meg-S	QJ1-136	PTA15L	Height
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7A	100K	½	75D20-118	AB-36	B47-100K-S	B17-138	PTA15L	AGC
B	Shaft			AK-1	Not Req.	TM1-K11	Not Req.	

● Not available as a factory assembled unit.
† "Concentrikit" Equivalent : K-5 Kit, Base Elements & Shafts : B13-139, P14-102 (Panel) B11-129, R1-118 (Rear)
†† "STA-LOC" Equivalent : FA26A, OS1062 (Panel), RU35L, LS437 (Rear)
‡ "Concentrikit" Equivalent: K-6 Kit, Base Elements & Shafts : B11-138, P14-102 (Panel) B17-108, R1-118 (Rear)
‡‡ "STA-LOC" Equivalent : FA15L, OS1062, RU13R, LS1562.
Note 1. Alternate Part #75C44-2.
Note 2. Ch. 18A6C, CB, T, TB use individual controls: Tone Part #75B13-103, Vertical Part #75B13-102.
In Ch. 18A6U6C, CB, T, TB use only the individual Vertical control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R8	2200Ω	3	61B24-333	Note 1
R9	1000Ω		60B8-102	
R10	8300Ω	3	61B24-347	
R11	4700Ω	4	61B24-441	
R12	33Ω		60B8-330	
R13	4700Ω 5%		60B7-472	
R14	1000Ω		60B8-102	
R15	39K		60B8-393	
R16	470Ω		60B8-471	
R17	47Ω		60B8-470	
R18	220K		60B8-224	
R19	4700Ω		60B8-472	
R20	22K		60B8-223	
R21	470Ω		60B8-471	
R22	220K		60B8-224	
R23	68Ω		60B8-680	
R24	470Ω		60B8-471	
R25	150Ω		60B8-151	
R26	3300Ω		60B8-332	
R27	47K		60B8-473	
R28	100Ω		60B8-101	
R29	100K		60B8-104	
R30	6800Ω		60B8-682	Note 2
R31	15K		60B8-153	
R32	5600Ω	4	61B24-443	
R33	47K	1	60B14-473	
R34	15K		60B8-153	
R35	82K		60B8-823	
R36	39K	1	60B14-393	
R37	180Ω		60B8-181	
R38	130K		60B8-134	
R39	82K		60B8-823	
R40	390K		60B8-394	
R41	2.2meg		60B8-225	
R42	150K		60B8-154	
R43	3meg 5%		60B7-305	
R44	10meg		60B8-106	
R45	39K		60B8-393	
R46	56K		60B8-563	
R47	8200Ω	1	60B14-822	
R48	56K		60B8-563	Note 3
R49	100K		60B8-104	
R50	560K		60B8-564	
R51	100K		60B8-104	
R52	560K		60B8-564	
R53	8200Ω		60B8-822	
R54	680Ω		60B8-681	
R55	47K		60B8-473	
R56	1meg 5%		60B7-105	

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R57	1meg 5%		60B7-105	
R58	150Ω		60B8-151	
R59	220Ω	2	61B20-221	
R60	70000Ω	7	61B20-29	Note 4
R61	47K		60B8-473	
R62	56K		60B8-563	
R63	4.7meg		60B8-475	
R64	270K		60B8-274	
R65	4.7meg		60B8-475	
R66	2.2meg		60B8-225	
R67	6800Ω		60B8-682	
R68	5600Ω		60B8-562	
R69	3300Ω		60B8-332	
R70	15K		60B8-153	
R71	15K		60B8-153	
R72	220K		60B8-224	
R73	220K		60B8-224	
R74	470K		60B8-474	
R75	56K		60B8-563	
R76	2.2meg		60B8-225	
R77	39K	1	60B14-393	Note 5
R78	470Ω	3	61A1-45	
R79	100Ω		60B8-101	
R80	27K	1	60B14-273	
R81	180Ω	1	60B14-181	
R82	39K		60B8-393	
R83	220Ω		60B8-221	
R84	3.8Ω Cold		61A27	
R85	220Ω		60B8-221	
R86	2200Ω		60B8-222	
R87	100K		60B8-104	
R88	100K		60B8-104	
R89	22K	3	61B24-357	
R90	4.7meg		60B8-475	
R91	470K		60B8-474	
R92	10K		60B8-103	
R93	1200Ω		60B8-122	
R94	47K		60B8-473	
R95	82K		60B8-823	
R96	15K		60B8-153	
R97	100Ω		60B8-101	
R98	1meg		60B8-105	
R99	12K	3	61B24-351	
R100	220K		60B8-224	
R101	150K		60B8-154	
R102	470K		60B8-474	
R103	4700Ω		60B8-472	
R104	1.2Ω		60B28-64	
R105	270K		60B8-274	Note 6

Note 1. Used in UHF Chassis. VHF Chassis use 9100Ω 5% 2W (Part #60B18-912), except Ch. 18C6C, 18C6T stamped Run 18 and higher which use 10K 3W.
Note 2. Not used in chassis stamped Run 10 or Run 16 and higher.
Note 3. Not used in chassis stamped Run 10.
Note 4. A 15K 2W resistor is used in VHF versions (Part #60B20-153).
Note 5. Not used in chassis stamped Run 10, Run 11.
Note 6. Chassis stamped Run 15 and higher use 470K in this application (Part #60B8-474).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	41.25MC Trap Coil	73B37-4					
L2	47.25MC Trap Coil	73B37-4					
L3	1st Video IF	73C132-31					
L4	2nd Video IF	73C132-39					
L5	Fil. Choke	73B37-2	19-1001	BC-562	4804		1.4 Microhenries
L6	3rd Video IF	73C132-38					
L7	4th Video IF	73B18L-3					Includes R64, C24, C28
L8	RF Choke	73B31-4					
L9	Shunt Peaking Coil	73B6-20	19-3500	TV-209	6174	VP-8	500 Microhenries
L10	RF Choke	73B31-3					38 Microhenries
L11	Series Peaking Coil	73B5-32	19-3180 ▲	TV-184 ▲	6180 ▲	VP-8 ▲	184 Microhenries, wound on 18K resistor, Note 1 Wound on 10K resistor Includes C38, C28
L12	Shunt Peaking Coil	73B5-36					
L13	1st Sound IF	73C188-3					
L14	2nd Sound IF	72B186-1					
L15	Quadrature Coil	72C132-37					

Note 1. Chassis stamped Run 16 or higher use Part #73C5-23 wound on 4700Ω resistor.
▲ Parallel with 18K resistor

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	NOTES
L16	100Ω		94C17-7	19-1576*	TV-163 *	6210 *	H-102 *	HS-5 *	Horiz. Freq. * Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE @ CURRENT 1000 ℃	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L17	.285A	48Ω	1.7 Hy.	74B18-28 ①	C5037	C-2996		C-2328	26C44	C-17X

① Use Part #74B18-27.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117V Ⓐ1.9A	560VCT Ⓑ.285A	5V Ⓒ3.5A	80D65-2 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V Ⓓ1.8A									

① Used in UHF-VHF Models. VHF Models except those using Remote Control Unit 8RI use Part #80D65-1. VHF Models using Remote Control Unit 8RI use Part #80D65-3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Vert. Output	79B43-16			V319			26S14	A-113X ①
T3	Yoke-Horiz. (18.8MH) (10Ω)-Vert. (13.8MH)	94D50-4 ②			Y-110 ③④		DY-27A ④	Y-52 ④	Y-80 & NW25 & YC-110
	Rear Cover & Centering Device	94C152-1			X163 *	EFR172*	SO-304 *	FLY-137*	D-151
T4	Horiz. Output	79D77-4							

① Connect as autoformer.
② Includes yoke plug.
③ Connect yoke terminal #2 to yoke plug pin #3, yoke terminals #1 and #3 to yoke plug pin #4, yoke terminal #10 to yoke plug pin #5.
④ Use original yoke damping network, if necessary. Requires new rear cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5		5	5	5	5		
6		6	4	6	6		
7		7	2	7	7		
8		8	1	8	8		
2		2	7	2	1		
1		1	8	1	2		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	78B139-7 ①	5AIR	① Used in Models T2UG1, 2, 11, 12, 13, T2UG3, 3, 11, 12, 13, T2UG22, 23
	5"	PM		78B139-8 ②		② Used in Models C2UG2, 3, 13, 13, 14, 22, 23, 24, C2UG3, 3, 12, 13, 14, 22, 23, 24, L2UG12, 13, 14, L2UG3, 12, 13, 14
	5"	PM		78B139-2 ②		③ Used in Models LS2UG42, 43, 44
	6"	PM		78C134-7 ③		④ Used in Models CS2UG62, 63, 64
	8"	PM		78K335-10 ④		
	5"	PM		78B139-10 ④		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	ADMIRAL PART No.	FEDERAL PART No	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1		93B5-4 ①	K1616 ①		SD-91 ②		① Selenium type. ② Silicon type, 2 used.

ADMIRAL CHASSIS 18A6C, CB, T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8RI

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	3/4A 125V S/B	84A13-38 ①	84A12-13	333.750 (N-3/4A-125V-S/B)	346010	N 3/4	HN 1/4 to 3/4
	N	1A 125V S/B	84A13-40 ②		333001 (N-1A-125V-S/B)	346011	N 1	HN 3/4 to 1 1/4
	N	6/10A 125V S/B	84A13-37 ③	84A12-13	333.600 (N-6/10A-125V-S/B)	346010	N 6/10	HN 1/2 to 3/4
M3	1" Length #26 Wire							

① Used in UHF-VHF Chassis stamped Run 16 and lower.
② Used in UHF-VHF Chassis stamped Run 17 and higher.
③ Used in VHF Chassis.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N87	1N87*	1N60	1N60	Video Detector (Pigtail) * Some versions may use 1N87A.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M5	Lamp	81A-8	#1847, Not used in Ch. 18A6, 18UA6
M6	Tuner	94E160-2	VHF with UHF provisions, Ch. 18UB6C, 18UB6T
	Tuner	94E160-10	VHF with UHF provisions, Ch. 18UA6C, 18UA6T
	Tuner	94E160-1	VHF, Ch. 18B6C, 18B6T
	Tuner	94E160-9	VHF, Ch. 18A6C, 18A6T
	Tuner	94D151-13	VHF, Ch. 18C6C, 18C6T
M7	Tuner	94D162-1	UHF, Ch. 18UA6C, 18UA6T, 18UB6C, 18UB6T
	Printed Board	A7185-1	Complete with components (Less Tubes)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

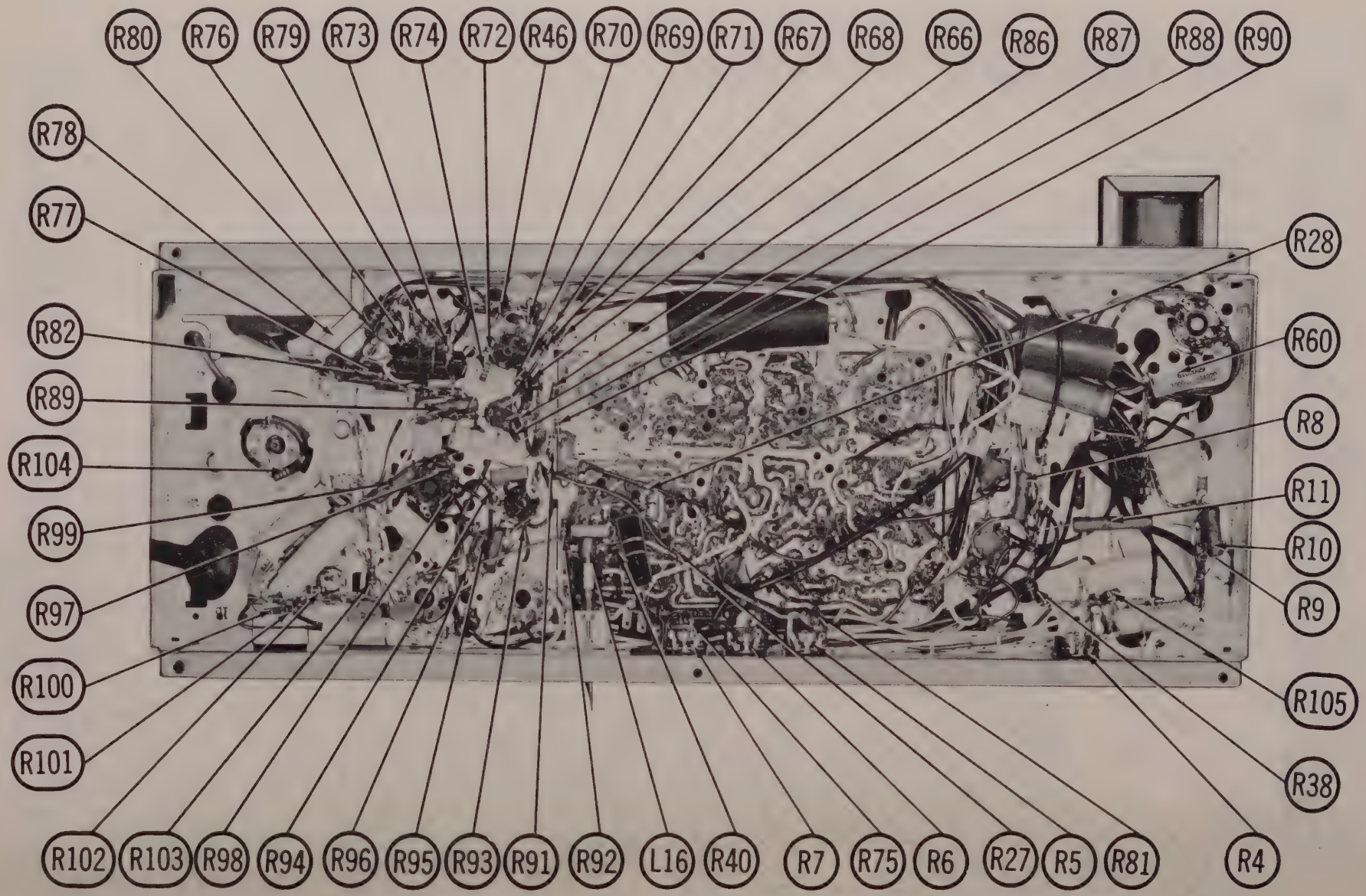
NAME	PART NO.	DESCRIPTION
Safety Glass	21D111-2	
Bezel	23C322-1	Tuner Bar ††
Knob	33D231-13	VHF Channel Selector * , UHF Fine Tuning *†
Knob	33D231-17	VHF Channel Selector †
Knob	33C288-2	UHF Channel Selector *†
Knob	33C288-3	VHF Fine Tuning *†
Knob	20C22-1	VHF Fine Tuning ††, Contrast *††, Vert. Hold *
Knob	20C22-4	Contrast †
Knob	20C22-2	Volume-Off-On *†† , Vert. Hold ††, Tone ††
Knob	20C22-5	Volume-Off-On † , Vert. Hold †
Knob	33B289-1	Brightness, All Models ; Tone *
Cabinet	34E135-9	Models T21G1, T21UG1
Cabinet	34E135-2	Models T21G2, T21UG2, T21G11, T21UG11
Cabinet	34E135-3	Models T21G12, T21UG12
Cabinet	34E135-4	Models T21G13, T21UG13
Cabinet	35E450-2	Models C21G12, C21UG12
Cabinet	35E450-3	Models C21G13, C21UG13
Cabinet	35E450-4	Models C21G14, C21UG14
Cabinet	35E443-2	Models C21G22, C21UG22
Cabinet	35E443-3	Models C21G23, C21UG3
Cabinet	35E443-4	Models C21G24, C21UG24
Cabinet	35E439-2	Models L21G12, L21UG12
Cabinet	35E439-3	Models L21G13, L21UG13
Cabinet	35E439-4	Models L21G14, L21UG14
Cabinet	35E466-2	Models C21G2, C21UG2
Cabinet	35E466-3	Models C21G3, C21UG3
Cabinet	35E463-2	Model LS21G42
Cabinet	35E463-3	Model LS21G43
Cabinet	34E135-7	Model TS21G22
Cabinet	34E153-8	Model TS21G23
Cabinet	35E449-2	Model CS21G62
Cabinet	35E449-3	Model CS21G63
Cabinet	35E449-4	Model CS21G64
Legs	35E450-52	Mahogany, Models C21G12, C21UG12
Legs	35E443-52	Mahogany, Models C21G22, C21UG22
Legs	37D168-42	Mahogany, Models L21G12, L21UG12
Legs	37D162-2	Mahogany, Models C21G2, C21UG2
Legs	35E450-53	Blonde, Models C21G13, C21UG13
Legs	35E443-53	Blonde, Models C21G23, C21UG23
Legs	37D168-43	Blonde, Models L21G13, L21UG13
Legs	37D168-3	Blonde, Models C21G3, C21UG3
Legs	35E450-54	Ebony, Models C21G14, C21UG14
Legs	35E443-54	Ebony, Models C21G24, C21UG24
Legs	37D168-44	Ebony, Models L21G14, L21UG14
Legs	35E463-51	Model LS21G42
Legs	35E463-52	Model LS21G43

* Models T21G11, T21UG11, T21G12, T21UG12, T21G13, T21UG13, C21G12, C21UG12, C21G13, C21UG13, C21G14, C21UG14, C21G22, C21UG22, C21G23, C21UG23, C21G24, C21UG24, L21G12, L21UG12, L21G13, L21UG13, L21G14, L21UG14.
† Models T21G1, T21UG1, T21G2, T21UG2, C21G2, C21UG2, C21G3, C21UG3
†† Models LS21G42, LS21G43, TS21G22, TS21G23, CS21G62, CS21G63, CS21G64.

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

PRINTED BOARD - RESISTOR, INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW - RESISTOR IDENTIFICATION

TUNER ALIGNMENT INSTRUCTIONS
94D151-13, -14, -20

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.

VHF OSCILLATOR ALIGNMENT

Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (T). Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
"	"	213MC	211.25MC 215.75MC	13	"		Check for response similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustments of A201 and A202, with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
		207MC	205.25MC 209.75MC	12			
		201MC	199.25MC 203.75MC	11			
		195MC	193.25MC 197.75MC	10			
		189MC	187.25MC 191.75MC	9			
		183MC	181.25MC 185.75MC	8			
		177MC	175.25MC 179.75MC	7			
		85MC	83.25MC 87.75MC	6			
		79MC	77.25MC 81.75MC	5			
		69MC	67.25MC 71.75MC	4			
		63MC	61.25MC 65.75MC	3			
		57MC	55.25MC 59.75MC	2			

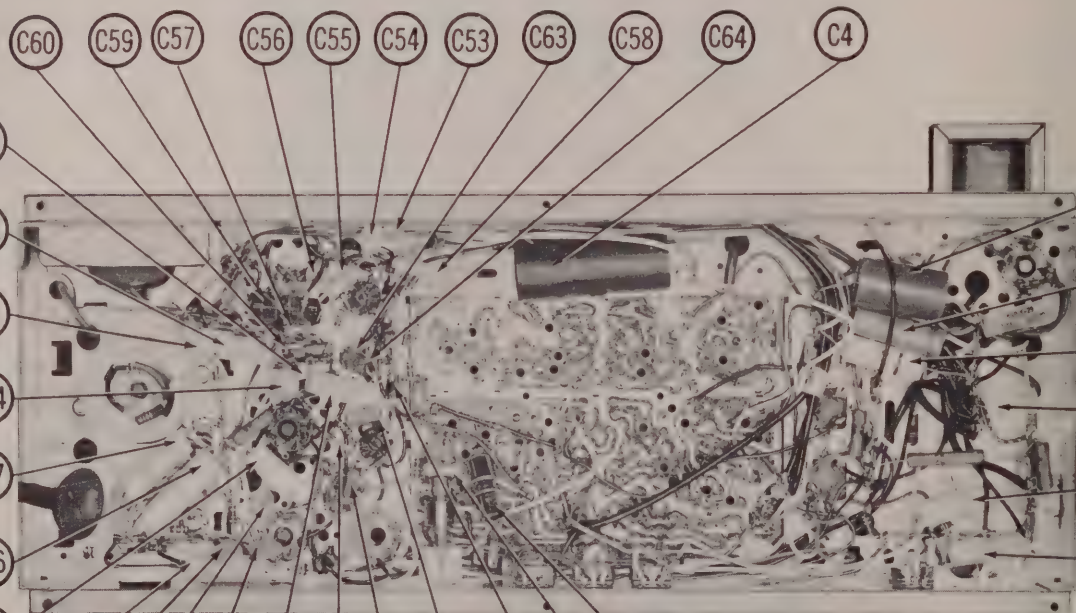
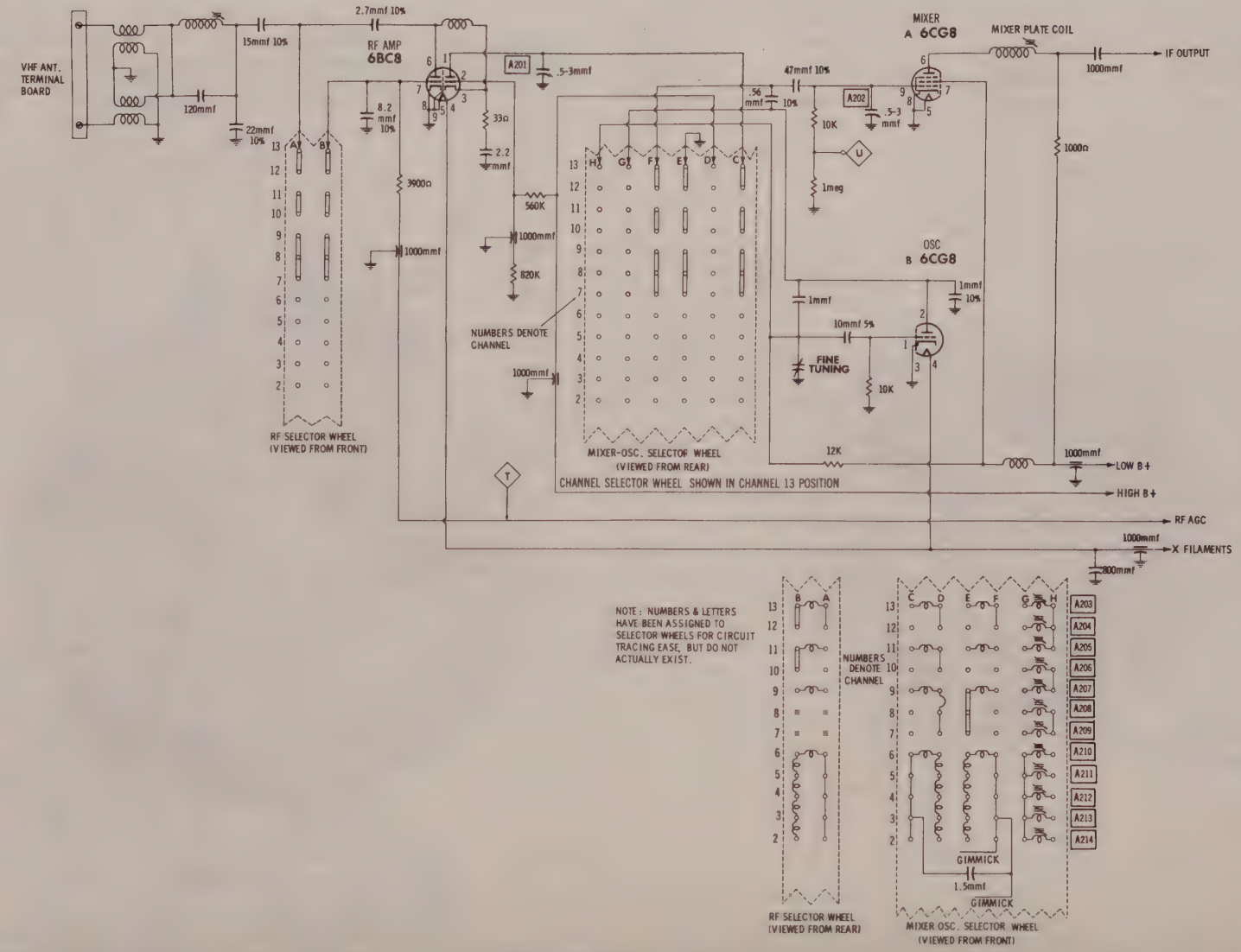


FIG. 201

CHASSIS BOTTOM VIEW - CAPACITOR IDENT

TUNER 94E160-2 ROTOR



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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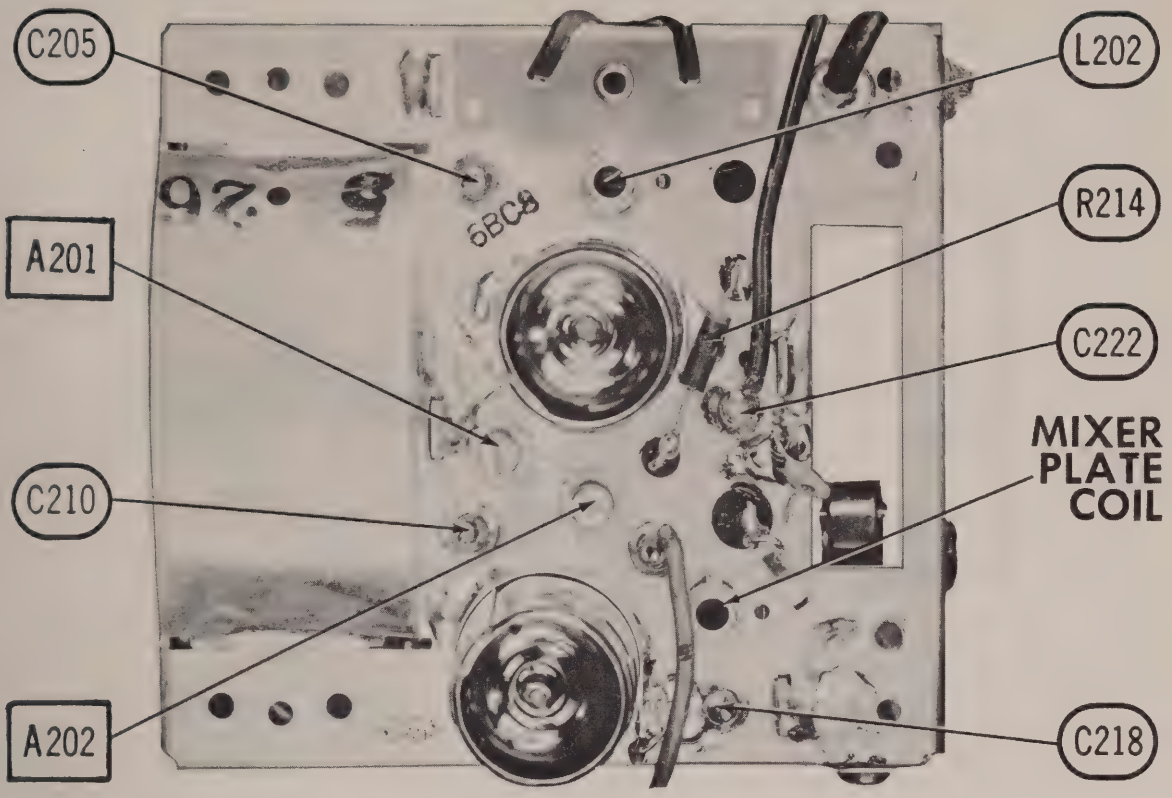
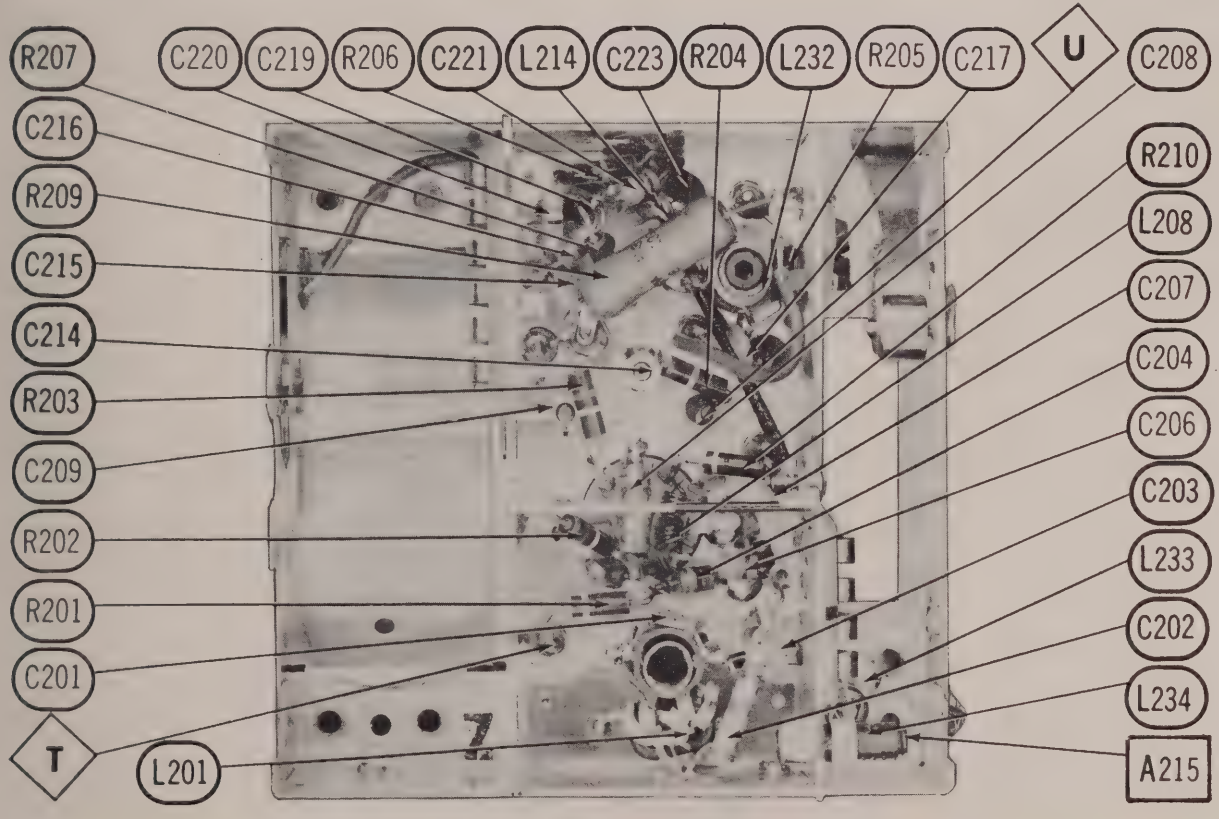
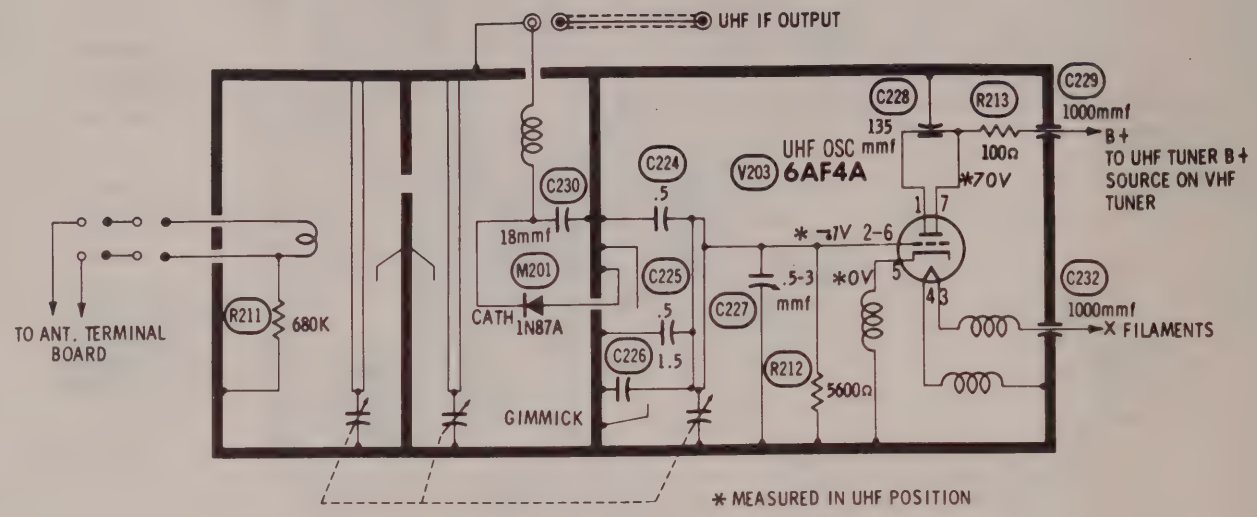
VHF TUNER 94E160-1, -9



TUNER 94E160-2 - TOP VIEW



TUNER 94E160-2 - BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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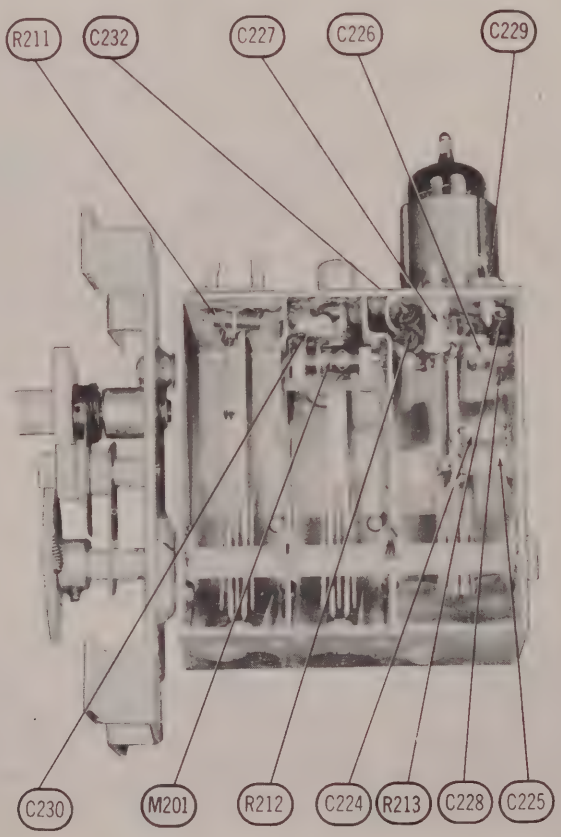
UHF TUNER 94D162-1



TUNER 94D162-1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A1, A2 ..... General Cement #5000, 5003, 8276 or 8290
Walsco #2512 or 2525
A3 thru A11... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply thru a 10K resistor to point Ⓐ.
Connect positive lead to chassis.
Turn super range finder control fully clockwise.
Connect a 270mmf capacitor across the VTVM test leads. Use the lowest scale on the VTVM. While peaking the adjustments, keep reducing the signal generator to keep the VTVM reading no higher than -1 volt DC.
Connect a short across the antenna terminals.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	41.25MC (Unmod)	12	DC probe thru 47K to point Ⓑ. Common to chassis. (Across video det. load).	A1	Adjust for MINIMUM deflection.
2.	"	"	47.25MC	"	"	A2	"
3.	"	"	42.3MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	45.3MC	"	"	Mixer Plate Coil & A4	"
5.	"	"	41.5MC	"	"	A5	"
6.	"	"	42.0MC	"	"	A6	"
7.	"	"	43.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Leave the super range finder control fully clockwise.
Connect a 270mmf capacitor across the input leads of the scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	41.25MC 42.0MC 43.5MC 45.0MC 45.75MC 47.25MC	12	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across video det. load).		Check for response similar to Fig. 1 with markers as indicated. If curve does not resemble Fig. 1, repeat "Video IF Alignment".
9.	"	"	"	45.0MC	"	"		Connect a short, heavy, solid jumper across L3. Response curve should be similar to Fig. 2. If the 45.0MC marker does not fall on the peak adjust the mixer plate coil slug until it does. Remove the short and repeat step 3 of the "Video IF Alignment". Recheck step 8 above.

SOUND IF ALIGNMENT

Tune in the strongest TV signal available in the area. Adjust the set for normal operation. Turn the super range finder control fully counter clockwise.
Using a hexagonal non-metallic alignment tool, turn A8 slowly clockwise until a buzz is heard in the sound. Then turn counter clockwise for maximum undistorted sound. (There may be two points approximately ½ turn apart at which the sound is loud. Use the one with the slug the farthest clockwise.
Reduce the signal at the antenna terminals (by use of an adjustable attenuator or disconnecting the antenna) until a strong hiss similar to super regeneration is heard in the sound.
Carefully adjust A9 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal until the hiss returns, then readjust A9.
Carefully adjust A10 for MINIMUM 4.5MC beat pattern in the picture. 4.5MC beat interference appears as a very fine cross hatch pattern on the screen.
Carefully adjust A11 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal strength. Readjust A11.
Repeat entire procedure, if necessary. DO NOT RETOUCH A9 WITHOUT REPEATING ALL OF SOUND ALIGNMENT.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 7, 8 & 20

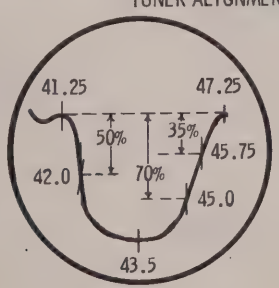


FIG. 1

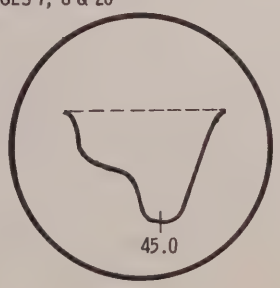
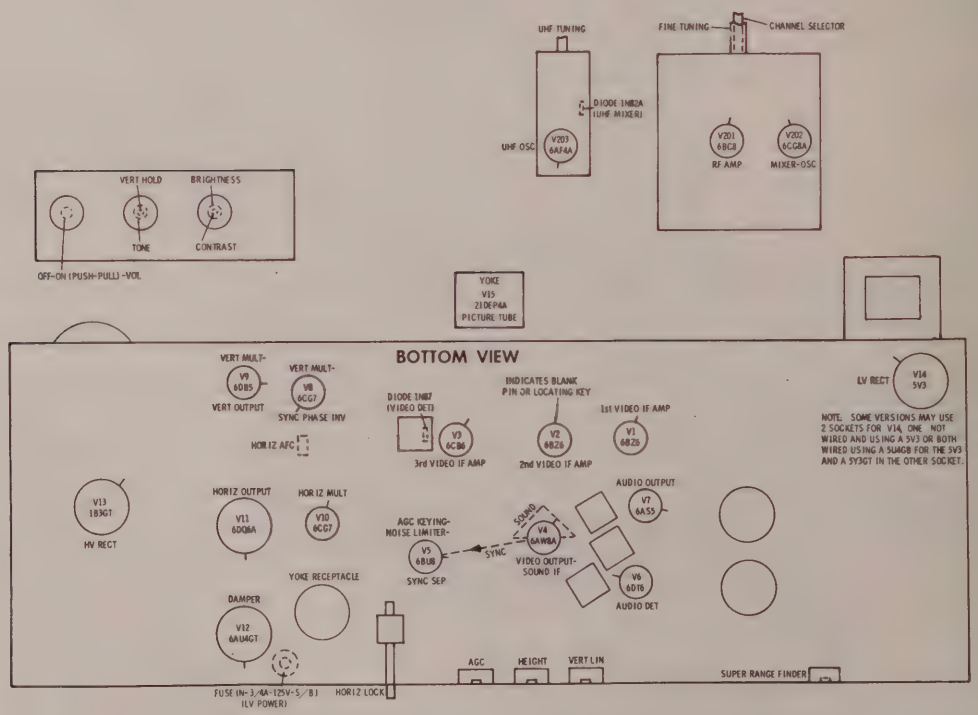


FIG. 2

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	▲ 22K	▲ 68Ω	.1Ω	0Ω	†470Ω	†470Ω	¶		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	■ 470Ω	■ 470Ω	0Ω		
V4	6AW8A	0Ω	100K	■ 35K	0Ω	.1Ω	● 82Ω	3400Ω	■ 12K	†4000Ω
V5	6BU8	■ 0Ω	†8200Ω	1.8meg	.1Ω	0Ω	†20K	■ ● 400K	†30K	■ 4.7meg
V6	6DT6	15.5Ω	680Ω	.1Ω	0Ω	†780K	■ 8200Ω	560K		
V7	6AS5	¶	500K	0Ω	.1Ω	500K	†220Ω	†510Ω		
V8	6CG7	●†1.1meg	220K	●115K	0Ω	.1Ω	†12K	1.4meg	3300Ω	0Ω
V9	6DB5	†27K	●400Ω	2.2meg	0Ω	.1Ω	2.2meg	●400Ω	NC	†850Ω
V10	6CG7	†10K	550K	1200Ω	.1Ω	0Ω	†82K	47K	1200Ω	0Ω
V11	6DQ6A	NC	0Ω	NC	†12K	1meg	TP	.1Ω	0Ω	TOP CAP † 9Ω
V12	6AU4GT	NC	NC	¶600K	NC	†0Ω	NC	.1Ω	0Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 454Ω
V14	5V3	NC	¶	NC	13Ω	NC	15Ω	NC	¶	
V15	21DEP4A	.1Ω	39K	†120K	†120K	NC	NC	● 90K	0Ω	
V201	6BC8	†2200Ω	280K	INF	.1Ω	0Ω	INF	3.2meg	0Ω	0Ω
V202	6CG8A	10K	†15K	0Ω	.1Ω	0Ω	†4900Ω	†3900Ω	0Ω	1.1meg
V203	6AF4A	•†10K	5600Ω	.2Ω	.1Ω	.1Ω	5600Ω	•†10K		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
■ MEASURED FROM 145V SOURCE.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM PIN 3 OF V12.
• MEASURED IN "UHF" POSITION.
NC NO CONNECTION
TP TIE POINT


UHF TUNING
FINE TUNING
CHANNEL SELECTOR
DIODE 1N82A (UHF MIXER)
UHF OSC
V203 6AF4A
V201 6BC8 RF AMP
V202 6CG8A MIXER-OSC
VERT HOLD
BRIGHTNESS
TONE
CONTRAST
OFF-ON (PUSH-PULL) -VOL
YOKE V15 21DEP4A PICTURE TUBE
BOTTOM VIEW
VERT MULT- V9 6DB5 VERT OUTPUT
VERT MULT- V8 6CG7 SYNC PHASE INV
HORIZ AFC
DIODE 1N87 (VIDEO DET)
INDICATES BLANK PIN OR LOCATING KEY
1st VIDEO IF AMP V1 6BZ6
3rd VIDEO IF AMP V3 6CB6
2nd VIDEO IF AMP V2 6BZ6
LV RECT V14 5V3
NOTE: SOME VERSIONS MAY USE 2 SOCKETS FOR V14, ONE NOT WIRED AND USING A 5V3 OR BOTH WIRED USING A 5U4GB FOR THE 5V3 AND A 5Y3GT IN THE OTHER SOCKET.
V13 1B3GT HV RECT
HORIZ OUTPUT V11 6DQ6A
HORIZ MULT V10 6CG7
AUDIO OUTPUT V7 6AS5
AGC KEYING-NOISE LIMITER- V5 6BU8 SYNC SEP
SOUND
SYNC
V4 6AW8A VIDEO OUTPUT-SOUND IF
V6 6DT6 AUDIO DET
YOKE RECEPTACLE
DAMPER V12 6AU4GT
AGC
HEIGHT
VERT LIN
SUPER RANGE FINDER
FUSE (N-3/4A-125V-S/B) (LV POWER)
HORIZ LOCK

TUBE PLACEMENT CHART

PHOTOFACT* Folder

with CIRCUITRACE*

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

MODEL 21T218 (Ch. 1-542-3)

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT* Folder with CIRCUITRACE*

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 screws holding rear cover.
2. Remove rear cover.
3. Locate fine tuning coupling shaft directly in front of the tuner. Compress sides together to disengage from slots in arm on tuner.
4. Remove picture tube socket, HV, speaker and picture tube ground leads and off-on plug. (NOTE: With off-on plug removed, a jumper must be used to operate receiver.)
5. Remove yoke retaining spring and remove yoke.
6. Remove 1 wood screw holding vert. hold shaft to cabinet.
7. Remove 2 metal screws holding chassis locking slots at bottom.
8. Disengage locking feet from bottom brace and remove chassis.

MODEL 21T218 (Ch. 1-542-3)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Sylvania	MODELS	CHASSIS
		21C529 Series, 21C534 Series	1-541-3, -4
		21C626 Series	1-541-5, -6
		21C414 Series, 21C519 Series	1-542-1, -2
		21C524 Series, 21T218 Series	1-542-3, -4
		21C616 Series, 21C621 Series, 21T305 Series	1-542-5, -6
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products Inc., 700 Ellicott St., Batavia, N.Y.		
TUBES	Sixteen (VHF), Seventeen (UHF)		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 190 Watts, 1.8 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 7 o'clock, proceed in a counterclockwise direction adjusting for best picture and sound.

SAFETY GLASS REMOVAL

Remove bottom center metal covering plate by pulling out. Remove 2 metal screws holding glass retaining clamp. Pull bottom of glass out SLIGHTLY and slip down to remove.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 7, or 6 and 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency coil is used as Horizontal Hold control. Adjust the Horizontal Hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A7) located on top of chassis.

FUSE

In Ch. 1-542-1 thru -6 one fuse is used for LV power supply protection. Ch. 1-541-3 thru -6 uses a circuit breaker for LV power supply protection. All chassis use a fuse wire for filament protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position two magnets so that all sides are straight.

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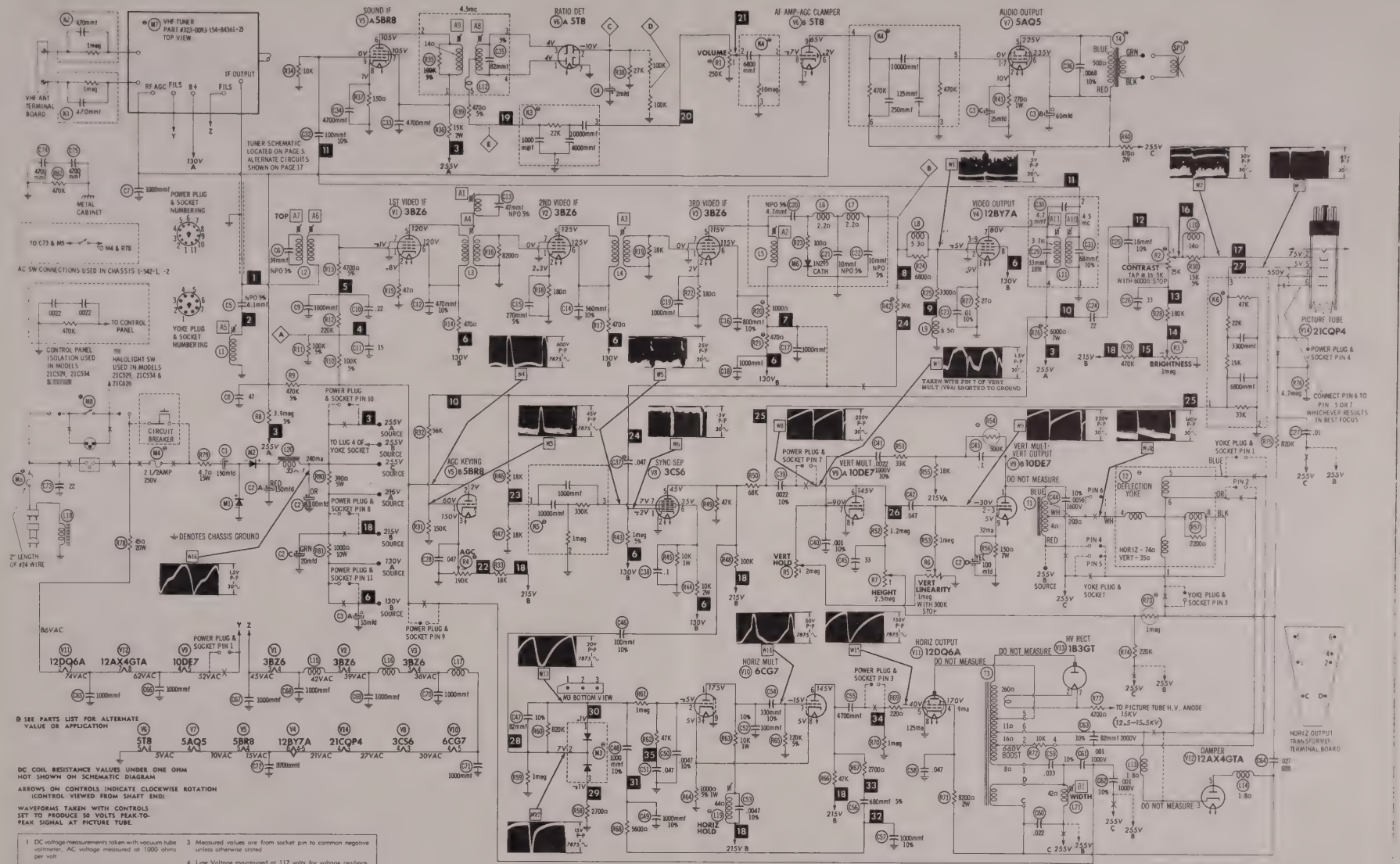
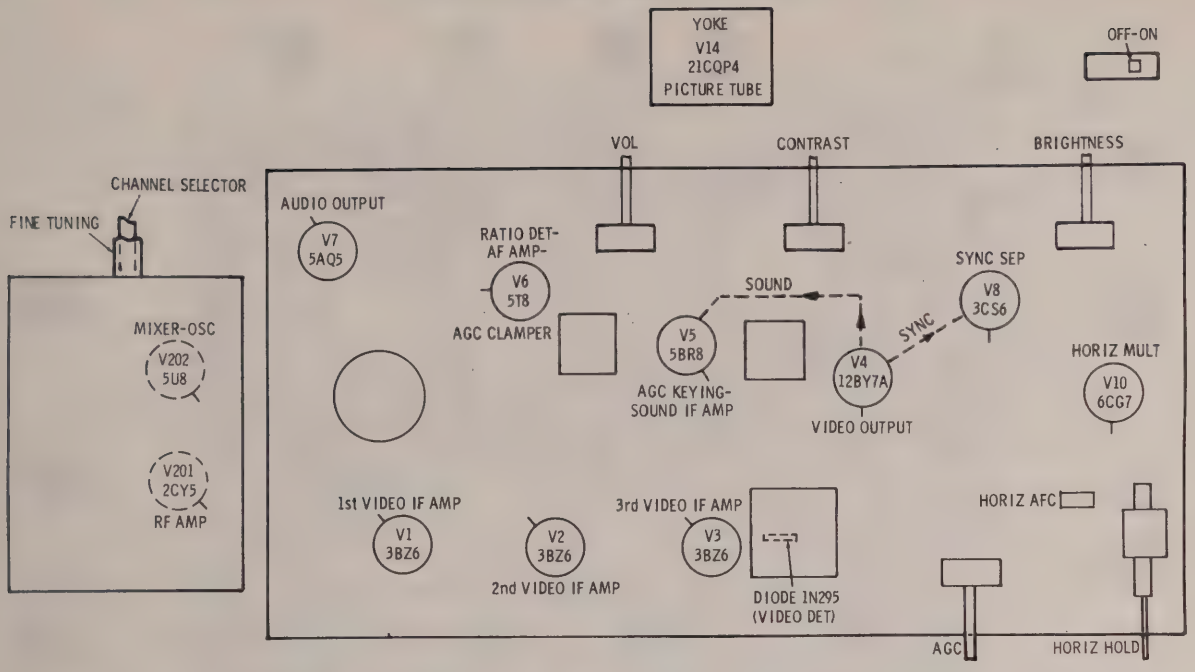

VHF TUNER PART #323-0093-154-84361-2 TOP VIEW
RF AGC
FILS
IF OUTPUT
VHF ANT TERMINAL BOARD
TUNER SCHEMATIC LOCATED ON PAGE 5 ALTERNATE CIRCUITS SHOWN ON PAGE 17
SOUND IF 5BR8
RATIO DET 5T8
AF AMP-AGC CLAMPER 5T8
AUDIO OUTPUT 5AQ5
VOLUME
1ST VIDEO IF 3BZ6
2ND VIDEO IF 3BZ6
3RD VIDEO IF 3BZ6
VIDEO OUTPUT 12BY7A
CONTRAST
BRIGHTNESS
PICTURE TUBE 21CQP4
POWER PLUG & SOCKET NUMBERING
YOKE PLUG & SOCKET NUMBERING
AC SW CONNECTIONS USED IN CHASSIS 1-542-1, -2
METAL CABINET
CONTROL PANEL ISOLATION USED IN MODELS 21C529, 21C534 & 21C626
HALOLIGHT SW USED IN MODELS 21C529, 21C534 & 21C626
CIRCUIT BREAKER
2 1/2 AMP 250V
2" LENGTH OF #24 WIRE
DENOTES CHASSIS GROUND
AGC KEYING 5BR8
SYNC SEP 3CS6
VERT MULT-VERT OUTPUT 10DE7
VERT HOLD
HEIGHT
VERT LINEARITY
HORIZ MULT 6CG7
HORIZ OUTPUT 12DQ6A
HV RECT 1B3GT
DAMPER 12AX4GTA
HORIZ - 74Ω VERT - 35Ω
DEFLECTION YOKE
YOKE PLUG & SOCKET
HORIZ OUTPUT TRANSFORMER-TERMINAL BOARD
TO PICTURE TUBE H.V. ANODE 15KV (12.5-15.5KV)
650V BOOST
WIDTH
HORIZ HOLD
CONNECT PIN 6 TO PIN 5 OF 7 WHICHEVER RESULTS IN BEST FOCUS
TAKEN WITH PIN 7 OF VERT MULT (V9A) SHORTED TO GROUND
DO NOT MEASURE
M3 BOTTOM VIEW
86VAC
12DQ6A 12AX4GTA 10DE7 3BZ6 3BZ6 3BZ6
74VAC 62VAC 52VAC 45VAC 42VAC 39VAC 36VAC
5T8 5AQ5 5BR8 12BY7A 21CQP4 3CS6 6CG7
5VAC 10VAC 13VAC 21VAC 27VAC 30VAC
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation; no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1959
SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

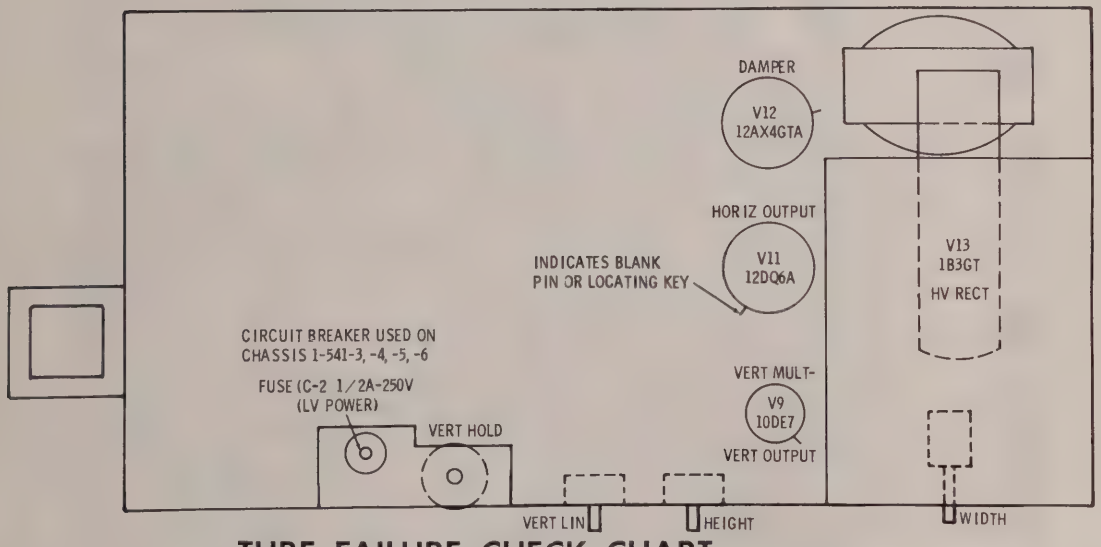
SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6)

FOLDER 2

TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

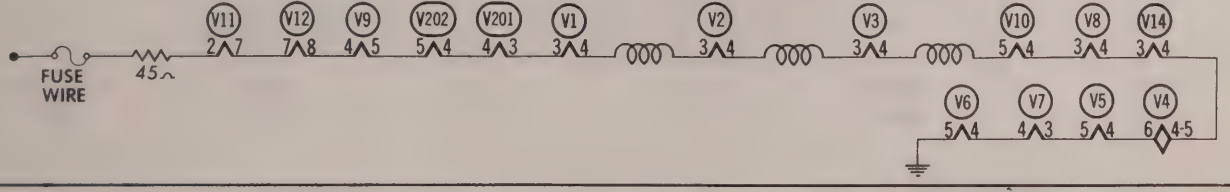
POWER SUPPLY FAILURE
No raster, no sound Fuse (2½A), Rectifier (B+), Fuse Wire (F11)

SWEEP FAILURE
No raster, has sound Rectifier (Horiz. AFC), V10, V11, V12, V13, V14
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rectifier (B+)
Vert. off freq. V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6, V7
Overloaded picture V5, V6

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, Rectifier (Horiz. AFC)
No vert. or horiz. sync V8

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



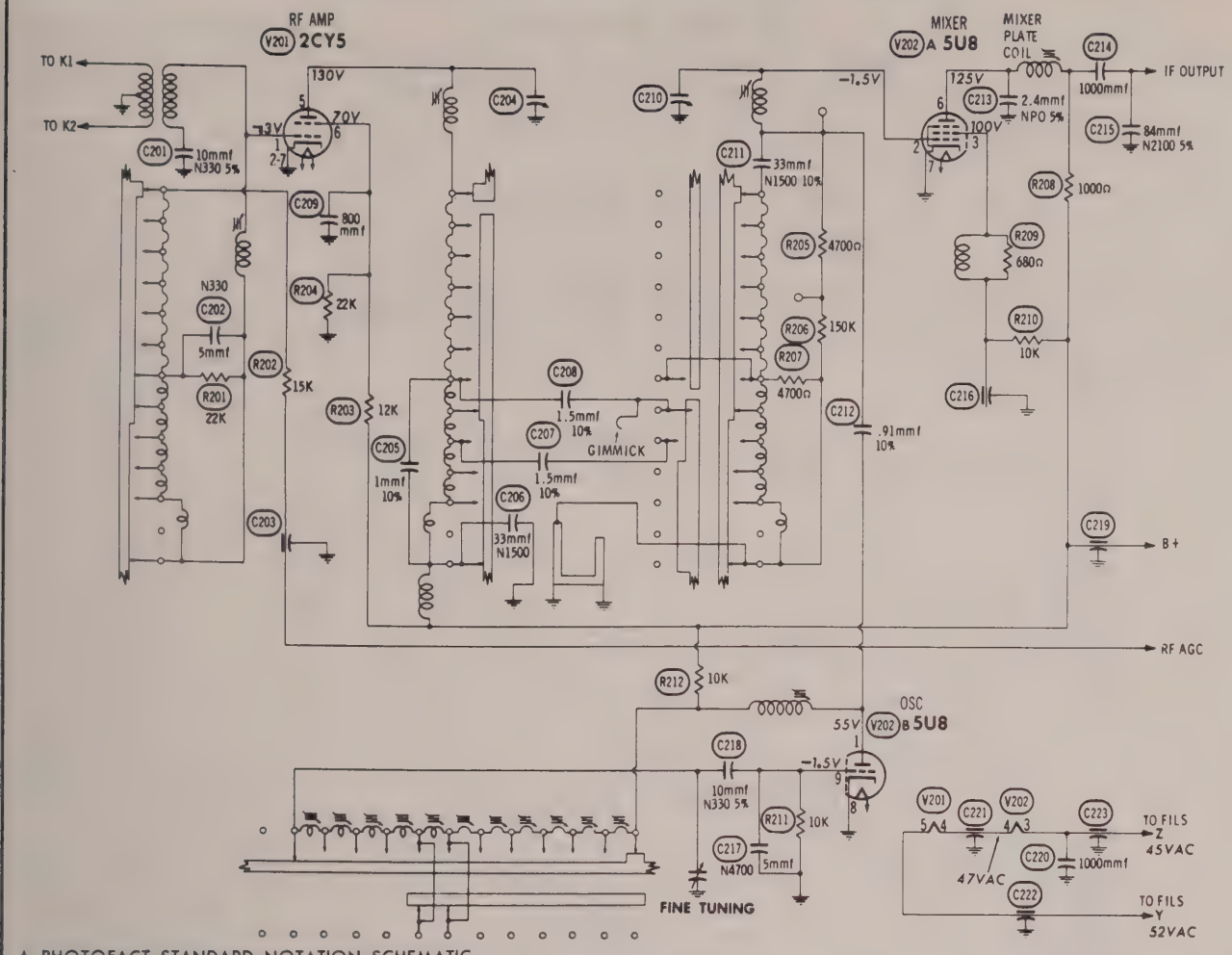
SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

FOLDER 2

A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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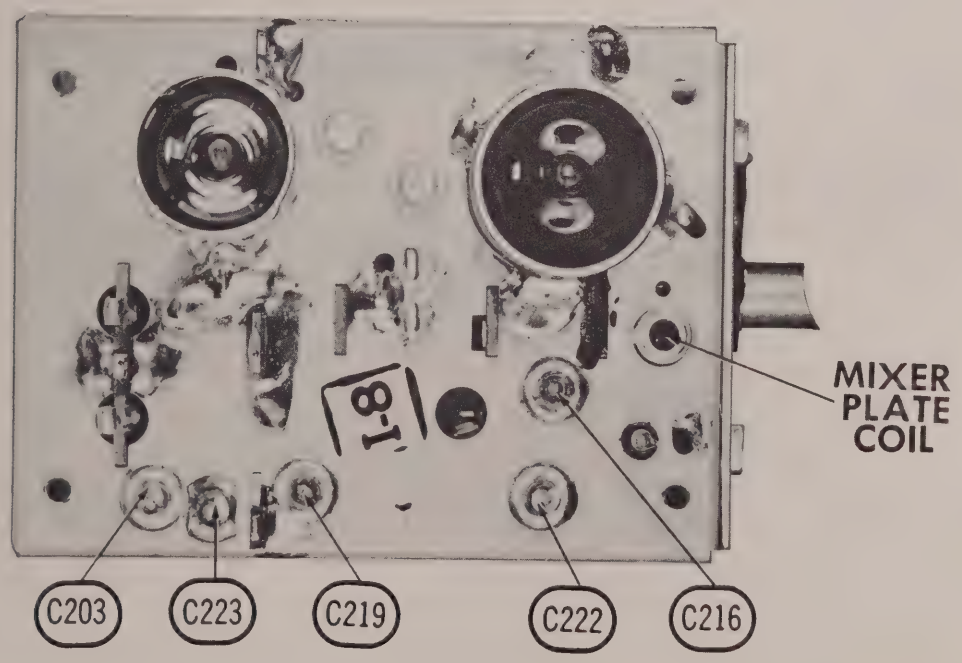
VHF TUNER 323-0093 (54-84361-2)



TUNER 323-0093 (54-84361-2) - TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

323-0093 (54-84361-2)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer- Osc.	5U8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	10								N330 5%
C202	5								N330
C203									
C204									
C205	1			NPO-SI 1	TCZ-1			5TCCB-V1	10%
C206	33								N1500
C207	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C208	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C209	800			BPD-0008	DD-801	L10T8		5GA-T8	
C210									
C211	33								N1500 10%
C212	.91								10%
C213	2.4								NPO 5%
C214	1000			BPD-001	DD-102	BYA6D1	B-210	5HK-D1	
C215	84								N2100 5%
C216									
C217	5								N4700
C218	10								N330 5%
C219									
C220	1000			BPD-001	DD-102	BYA6D1	B-210	5HK-D1	
C221									
C222									
C223									

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R201	22K			
R202	15K			
R203	12K			
R204	22K			
R205	4700Ω			
R206	150K			

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R207	4700Ω			
R208	1000Ω			
R209	680Ω			
R210	10K			
R211	10K			
R212	10K			

TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 7 o'clock, proceed in a counterclockwise direction for best picture and sound.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Suggest alignment tools A1 thru A10 .... General Cement #8606, 8606L, 8282, 9295
Walsco #2528, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Pre-set Mixer Plate Coil maximum counterclockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.0047mfd	High side to pin 1 (grid) of 3BZ6 (V1). Low side to chassis.	43.5MC	41.25MC	Any non-interfering channel	Vert. Amp. thru 33K to point (B). Low side to chassis. (Across Video Det. load)	A1	Adjust sweep generator to provide 3 volts peak to peak on scope. Adjust A1 to place 41.25MC marker in trap notch. (See Fig. 1)
2.	"	"	"	44.0MC	"	"	A2	Adjust for maximum response of the marker.
3.	"	"	"	45.3MC	"	"	A3	"
4.	"	"	"	42.7MC	"	"	A4	"
5.	"	"	"	41.25MC 42.6MC 45.75MC	"	"		Check for response similar to Fig. 1 with markers as shown. If necessary, retouch A2 thru A4 for desired response. A2 will remove the tilt, A3 positions the 45.75MC marker and A4 positions the 42.6MC marker.
6.	"	"	"	47.25MC	"	"	A5, A6	Adjust for MINIMUM response at 47.25MC marker. Repeat steps 1 thru 6.
7.	Direct	Place a thin insulated metal strip between the mixer-osc.tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.6MC 45.75MC 47.25MC	"	"	A7 & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Repeat steps 1 thru 7 as required.

SOUND IF ALIGNMENT

Connect the negative lead of a 30 volt bias supply to point (A). Positive to chassis.
Set the Contrast control fully clockwise and the Brightness control fully counterclockwise.
Connect two matched 100K (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001mfd	High side to point (B). Low side to chassis. (Across Video Det. load)	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 100K to point (E). Common to point (D).	A8, A9, A10, A11	Adjust for maximum deflection. Use peaks resulting in greatest separation of cores.
9.	"	"	"	"	"	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Set Contrast at maximum.
Tune in a strong TV station. Adjust A11 for MINIMUM 4.5MC beat in the picture. The 4.5MC beat interference gives a grainy appearance in the picture.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

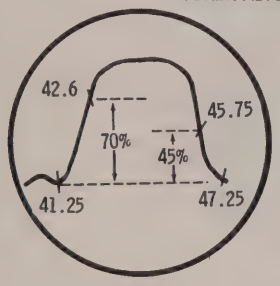


FIG. 1

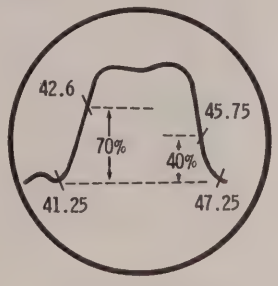
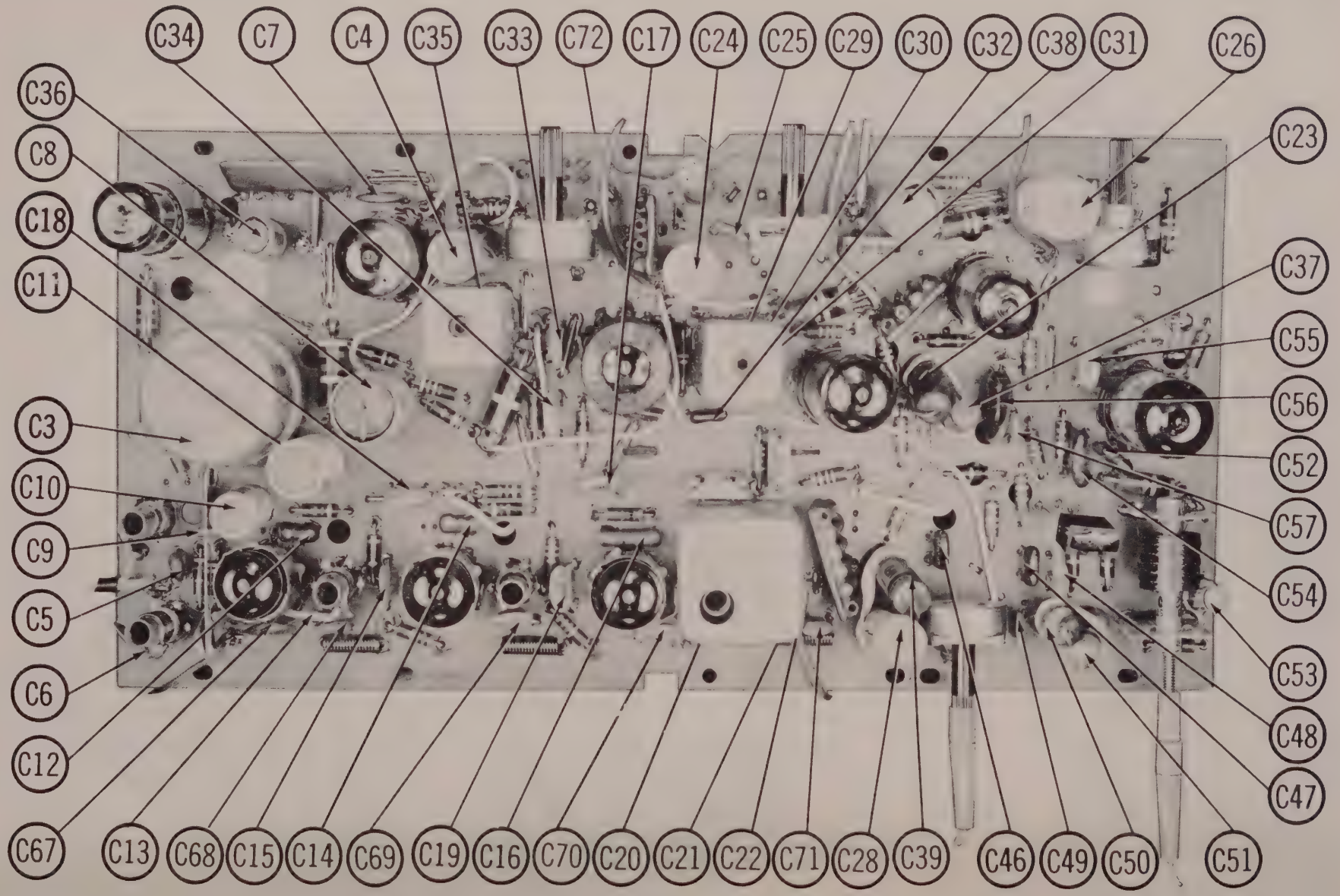
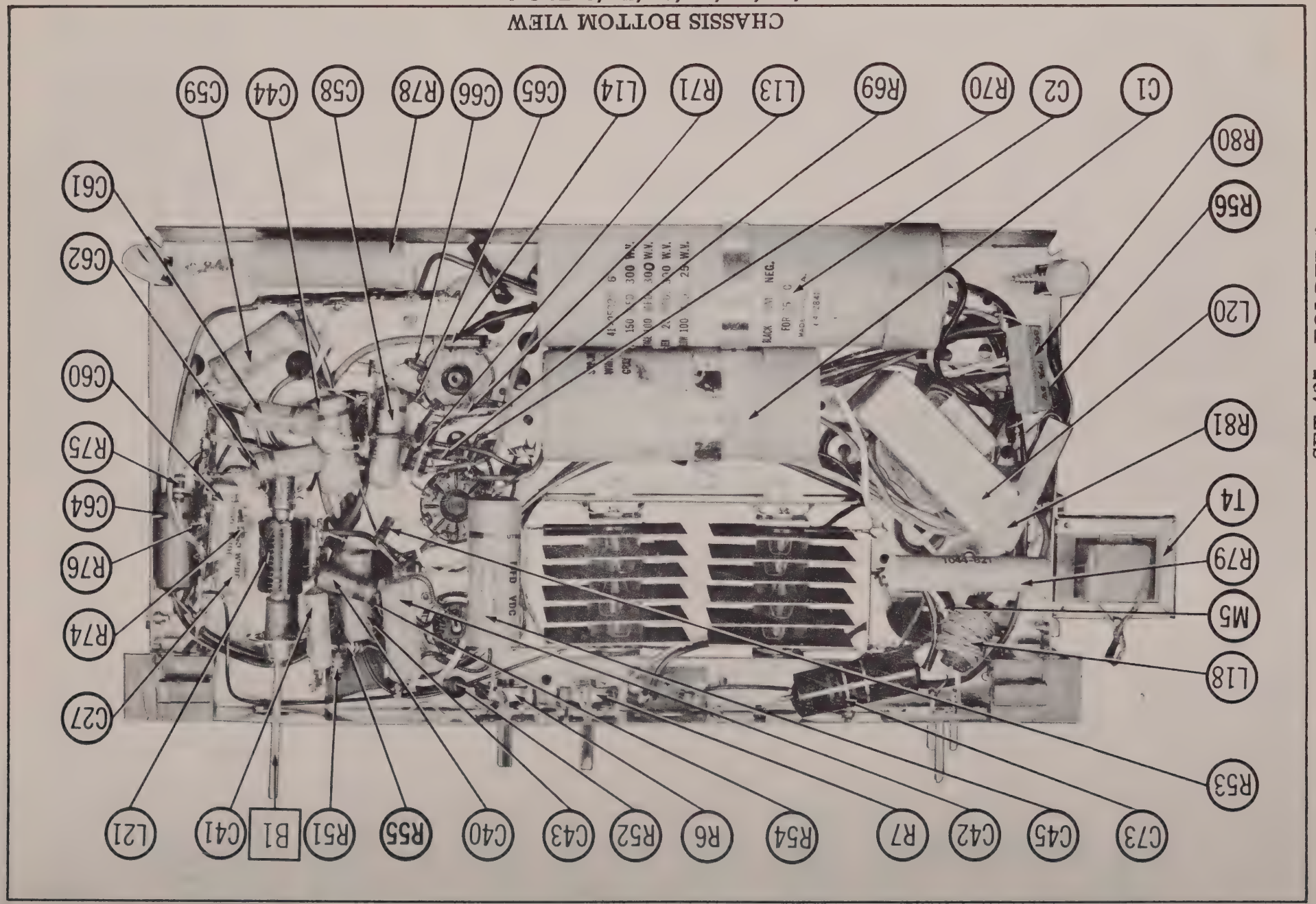


FIG. 2



PRINTED BOARD - CAPACITOR IDENTIFICATION

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd Video IF Amp.	2BZ6	
V4	Video Output	12BY7	
V5	AGC Keying-Sound IF Amp.	5BR8	
V6	Ratio Det. -AF Amp. - AGC Clamper	5T8	
V7	Audio Output	5AQ5	
V8	Sync Sep.	3CB6	
V9	Vert. Mult. - Vert. Output	10DE7	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	12DQ6A	
V12	Damper	12AX4GTA	
V13	HV Rect.	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	SYLVANIA PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V14	21CQP4			21CQP4 ①	① Silver Screen 65"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1	150	300	161-1025	PRI-100	XA0315	WD425	TD-150-300	S-160	
C2A	150	300	161-4024	PR4-260		WQ402			
B	100	300							
C	20	300							
D	100	25							
C3A	410	300	CK-3128	AFH3-98-60		PFP326.4			
B	460	300							
C	25	25							
C4	2	50	161-1041	PR250V2	BBR2-50	TT150X2	TD2-50	MT-0502	TVA-1301

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	4.1							5TCCB-V4J5 5% *	NPO 5%
C6	39						CNO-439	5TCC-G3S5 5% *	NPO 5%
C7	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C8	47	100		P288N-47		BC2P47J		2SE-P47	
C9	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C10	.22	100		P288N-22		BC2P22J	ACE0022	2SE-P22	
C11	.15	200				BC2P15J		2SE-P15	
C12	470				D6-471			5GA-T47S 10% *	10%
C13	47				DTZ-47		CNO-447	5TCC-Q47S 5% *	NPO 5%
C14	560				D6-561			5GA-T56S 10% *	10%
C15	270				DTZ-270			5GA-T27S 5% *	5%
C16	800							5GA-T8S 10% *	10%
C17	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C18	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C19	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C20	4.7				DTZ-4.7		CNO-547	5TCCB-V47S 5% *	NPO 5%
C21	10				DTZ-10		CNO-410	5TCC-Q1S 5% *	NPO 5%
C22	10				DTZ-10		CNO-410	5TCC-Q1S 5% *	NPO 5%
C23	.01	200						2WF-S10	10%
C24	.22	400		P488N-22		BC6P22J	ACE0022	4SE-P22	
C25	18				DD-180	C10Q18C	CNO-418	5GA-Q18S 10% *	10%
C26	.33	400				BC6P33J		4SE-P33	
C27	.01	600		P688N-01	DD-103	CUP6S1	GEM-611	6TM-S1	
C28	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C29	33			NPO-DI 33	DD-330	L10Q33	CNO-433	5GA-Q33S 10% *	10%
C30	4.7			NPO-DI 4.7	DD30-4R7	C10V47C	CNO-547	10GAB-V47	10%
C31	68			DI-68	DD-680	L10Q68	CNO-468	5GA-Q68S 10% *	10%
C32	100			1469-0001	DD-101	22R5T1	MCB-235	MS-31	10%
C33	4700			BPD-0047	DD-472	BYA10D47	B-347	5HK-D47	
C34	4700			BPD-0047	DD-472	BYA10D47	B-347	5HK-D47	
C35	82					22R5Q82		MS-482	5%
C36	.0068	600						6TM-D68S 10% *	10%
C37	.047	200		P388N-047	DF-503	CUB3S47	GEM-3147	3TM-S47	②
C38	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C39	.0022	400						5BF-D22	10%
C40	.001	600						6TM-D1S 10% *	10%
C41	.0022	1000	189-0063					10TM-D22S 10% *	10%
C42	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C43	1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C44	.0056	1600	189-0068					MB-D56S 10% *	10%
C45	.33	400		P488N-33			GEM-4033	4TM-P33S *	
C46	100			1469-0001	DD-101	22R5T1	MCB-235	MS-31	10%
C47	82			1469-000082	DD-820	22R5Q82		MS-482	10%
C48	1000			DI-1000	DD-102		JL-210	5GA-D1S 10% *	10%
C49	1000			DI-1000	DD-102		JL-210	5GA-D1S 10% *	10%
C50	.0047	200						5BF-D47	10%
C51	.047	200		P288N-047	DF-503	CUB3S47	GEM-4147	3TM-S47	
C52	100			1469-0001	DD-101	22R5T1	MCB-235	MS-31	10%
C53	.0047	400	189-0048					5BF-D47	10%
C54	330			1469-00033		5R5T33		MS-333	10%
C55	4700			BPD-0047	DD-472	BYA10D47	B-347	5HK-D47	
C56	680			1464-00068		1R5T68		MS-368	5%
C57	1000			DI-1000			JL-210	5GA-D1S 10% *	10%
C58	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C59	.033	600		P688N-033		CUB6S33	GEM-6133	6TM-S33S *	
C60	.022	200		P388N-022	DD-203	CUB2S22	GEM-4122	2TM-S22	
C61	.001	1000	189-0070					10TM-D1S 10% *	10%
C62	.001	1000	189-0070					10TM-D1S 10% *	10%
C63	2000	2000	189-0061	DI-X2		KJ0Q2	CNO-482	20GA-Q2S 10% *	10%
C64	.027	600						6TM-S27S 10% *	10%
C65	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C66	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C67	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C68	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C69	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C70	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C71	1000			BPD-001	DD-102	BYA10D1	B-210	5HK-DI	
C72	4700			BPD-0047	DD-472	BYA10D47	B-347	5HK-D47	
C73	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-P22	
C74	4700		189-0067	DI-4700	DD-472	L10D47	JL-347	5GA-D47	
C75	4700		189-0067	DI-4700	DD-472	L10D47	JL-347	5GA-D47	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Chassis coded 01 use .01mfd ② 200V in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	
R1	250K	½	153-0139					Volume, Note 1
R2	25K	½	153-0158					Contrast, Tap @ 16.5K with 6000Ω stop, Note 2
R3	1meg	½	153-0134					Brightness, Note 3
R4	190K	½	153-0138					AGC, Note 4
R5A	2meg	½	153-0159	AB-75	B47-2meg-S	Q11-139	PTA26L	Vert. Hold
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	1meg	½	153-0137	AB-69 †	B47-1meg-S†	Q11-137 †	SU-54 †	Vert. Linearity with 300K
B	Shaft			AK-19	Not Req.	TQ	Not Req.	stop
R7A	2.5meg	½	153-0125	AB-83	B47-2 5meg-S	Q11-239	SU-565	Height
B	Shaft			AK-19	Not Req.	TQ	Not Req.	

Note 1. Ch. 1-541-3, -4 use 250K control with switch (Part #153-0168). Ch. 1-541-5, -6 use alternate Part #153-0162.
Note 2. Ch. 1-541-3, -4, -5, -6 use alternate Part #153-0170.
Note 3. Ch. 1-542-1, -2 use lmeg control and Off-On switch (Part #152-0056). Ch. 1-541-3, -4, -5, -6 use alternate Part #153-0169.
Note 4. Ch. 1-541-3, -4, -5, -6 use alternate Part #153-0161.
† Use 300K resistor in series with right hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R8	3.3meg 5%			
R9	470K 5%			
R10	100K 5%			
R11	100K 5%			
R12	220K			
R13	4700Ω 5%			
R14	470Ω			
R15	47Ω			
R16	8200Ω			
R17	470Ω			
R18	180Ω			
R19	18K			
R20	1000Ω			Note 1
R21	470Ω			Note 2
R22	180Ω			
R23	100Ω			
R24	6800Ω			
R25	3300Ω			
R26	6000Ω	7		Note 3
R27	27Ω			
R28	180K			
R29	470K			
R30	15K 5%			
R31	150K			
R32	56K			
R33	18K			
R34	10K			
R35	100K 5%			
R36	15K	2		
R37	150Ω			
R38	27K			
R39	470Ω 5%			
R40	470Ω	2		
R41	270Ω	1		
R42	39K			Note 4
R43	1meg 5%			
R44	10K	2		
R45	10K	1		

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R46	18K			
R47	18K			
R48	100K			
R49	47K			
R50	68K			
R51	33K			
R52	1.2meg			
R53	1meg			
R54	500K			
R55	18K			
R56	150Ω	2		
R57	2200Ω			
R58	2700Ω			
R59	1meg			
R60	820K			
R61	1meg			
R62	47K			
R63	10K	1		
R64	1000Ω 5%	1		
R65	120K 5%			
R66	47K			
R67	2700Ω			
R68	5600Ω			
R69	220Ω			
R70	1meg			
R71	6200Ω	2		
R72	10K			
R73	1meg		189-0082	Note 5
R74	220K			
R75	820K			
R76	4.7meg			
R77	4700Ω			
R78	45Ω	20	187-0052	
R79	4.7Ω	15	187-0034	
R80	390Ω	5	187-0016	
R81	1000Ω	10	187-0026	
R82	470K			

Note 1. Chassis coded 01 use a 470Ω ½W in this application.
Note 2. Chassis coded 01 use a 2200Ω ½W in this application.
Note 3. Some versions may use 7000Ω 7W in this application (Part #189-0088).
Note 4. Not used in chassis coded 01.
Note 5. Temperature compensating

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	47.25MC Trap	118-0035					
L2	1st Video IF	120-0024					Includes 47.25MC Trap
L3	2nd Video IF	119-0023					Includes 41.25MC Trap
L4	3rd Video IF	119-0021					
L5	4th Video IF	119-0022					
L6	RF Choke	118-0030	19-1005	BC-566	4612		10.8 Microhenries
L7	RF Choke	118-0030	19-1005	BC-566	4612		10.8 Microhenries
L8	Series Peaking Coil	131-2036	19-3075		6172	VP-2	71 Micro henries
L9	Shunt Peaking Coil	131-2035	19-3100	TV-194	6112	VP-3	100 Microhenries
L10	Series Peaking Coil	131-2037	19-3375	TV-201	6134	VP-7	380 Microhenries
L11	1st Sound IF	120-0023					
L12	Ratio Detector	128-0015					
L13	Cathode Choke	118-0010	19-1005	BC-566	4612		13 Microhenries
L14	RF Choke	118-0010	19-1005	BC-566	4612		13 Microhenries
L15	Fil. Choke	118-0032	19-1000	BC-561	4602		1.2 Microhenries
L16	Fil. Choke	118-0032	19-1000	BC-561	4602		1.2 Microhenries
L17	Fil. Choke	118-0032	19-1000	BC-561	4602		1.2 Microhenries
L18	Line Choke	118-0031					119 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	* DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	
L19	44Ω		132-0019 ①						① Ch. 1-541-3, -4, -5, -6 use Part #132-0022.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	SYLVANIA PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L20	.240A	33Ω	1.1 Hy.	145-0020					26C44	C-23X

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Miller PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No.	Triad PART No
L21	Width Coil (12-50MH)	132-0021		MWC-3	6319				WC-19	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								
		SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	Vert. Output	241-0045	21900 ①②				A-8148 ③	26S78 ①③ T-46	A-118X ③
T2	Yoke-Horiz. (30MH) (110°) - Vert. (32MH)	100-0032		MDF-110					
	Alt. Yoke	100-0033							
	Rear Cover & Centering Device	400-0034							
	Yoke Clamp	487-0076							
T3	Horiz. Output	241-0046		HVO-126 *				FLY-148 *	

① Use 8 : 1 turns ratio. ② Connect as autoformer. ③ Drill new mounting hole(s).

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5		5				5	
	6		6				6	
	3		3				3	
	1		1				1	
	D		D				D	
	C		C				C	
Connect Width Coil Across →	D & C		D & C				D & C	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	5 3/4"	PM	3-4Ω	539-0576 ①	52AI	① Used in Models 21T28 Series, 21T305 Series
	8"	PM	3-4Ω	539-0808 ②	8AI	② Used in Model 21C414 Series
	8"	PM		539-0809 ③		③ Used in Models 21C319 Series, 524 Series, 618 Series, 621 Series
	4"	PM		539-0430 ③		
	4"	PM		539-0408 ③		④ Used in Models 21C529 Series, 534 Series
	4" x 8"	PM		539-4804 ④		⑤ Used in Model 21C626 Series
	4" x 8"	PM		539-4805 ④		
	6" x 9" x 2"	Coax PM		539-6906 ⑤		
	6" x 9" x 2"	Coax PM		539-6907 ⑤		

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA	
K1	Ant. Input	470mmf, 1meg	190-0035	Centralab Sprague	RC-471 ACI-1
K2	Ant. Input	470mmf. 1meg	190-0035	Centralab Sprague	RC-471 ACI-1
K3	De-Emphasis	1000mmf, 4000mmf, 10000mmf, 22K	190-0034 ①	Centralab Sprague	PC-196 PB-3
K4	Audio Circuit	6800mmf, 250mmf, 10000mmf, 125mmf, 470K, 470K, 10meg	190-0039 ②		
K5	Sync Take-off	10000mmf, 1000mmf, 1meg, 330K	190-0043 ③		
K6	Vert. Retrace	6800mmf, 3300mmf, 33K, 15K, 22K, 47K	190-0037 ④		

① Item #32-91108-1 or 32-85954-1. ③ Item #32-91133-2 or 32-88098-2.
② Item #32-85947-2 or 32-91109-2. ④ Item #32-91141-2 or 32-85945-2.

RECTIFIERS

ITEM No	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SYLVANIA PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES-TARZIAN PART No.	
M1	.240A	517-0010 ①	124IAH 1	1N1008 ②	T400 1 TV500 3	400A 1 4 40K 3 4	① Selenium Type. ② Germanium Type. ③ Silicon Type. ④ Add 7.5Ω resistor in series. ⑤ Two used. *Alternate Part #624-0007
M2	.240A	517-0010 ①	124IAH 1	1N1008 ②	T400 1 TV500 3	400A 1 4 40K 3 4	
M3		524-0008* ①	R1615 ①		SD-91 ③ ⑤		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	C	2½A 250V	191-0022 ①	562-0011	33302.5 (C-2½A-250V)	348006	C 2½	HC 1 3/4 to 2 1/2
M5	2" Length of #24 Wire ②							

① Ch. 1-541-3, -4, -5, -6 uses a circuit breaker in this application (Part #191-0026).
② Some versions may use #32 in this application.

SYLVANIA CHASSIS 1-541-3, -4, -5, -6, 1-542-1, -2, -3, -4, -5, -6

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SYLVANIA PART No.	CBS PART No.	SYLVANIA PART No.	
M6	1N295	1N295	1N60	1N295	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M7	Tuner	323-0093	VHF (54-84361-2)
	Tuner	323-0093	VHF (54-95362-2)
	Tuner	323-0093	VHF (54-84380-2)
	Tuner	323-0090	VHF (54-95604-9)
	Tuner	323-0095	VHF (54-84380-3)
	Tuner	323-0097	VHF (54-88847-1)
	Tuner	323-0098	VHF (54-88847-2)
	Tuner	323-0089	UHF (54-93870-7)
	Tuner	323-0096	UHF (54-88853-1)
	Tuner	323-0099	UHF (54-84679-1)
M8	Switch	571-0018	Power, On-Off, SPDT (Push Type) Ch. 1-542-3, -4, -5, -6
	Switch	571-0029	Power, On-Off, SPST (Push Type) Ch. 1-541-5. -6
	Switch	571-0028	HaloLight, On-Off SPST Ch. 1-541-3, -4
	Switch	571-0030	HaloLight, On-Off (Rotary Wafer Type) Ch. 1-541-5, -6
	Circuit Breaker	191-0026	Ch. 1-541-3, -4, -5, -6
	Tube	611-2107	HaloLight, Models 21C529, 21C534, 21C626
	Tube	611-2106	HaloLight, Models 21C616, 21C621, 21T305

CABINETS & CABINET PARTS

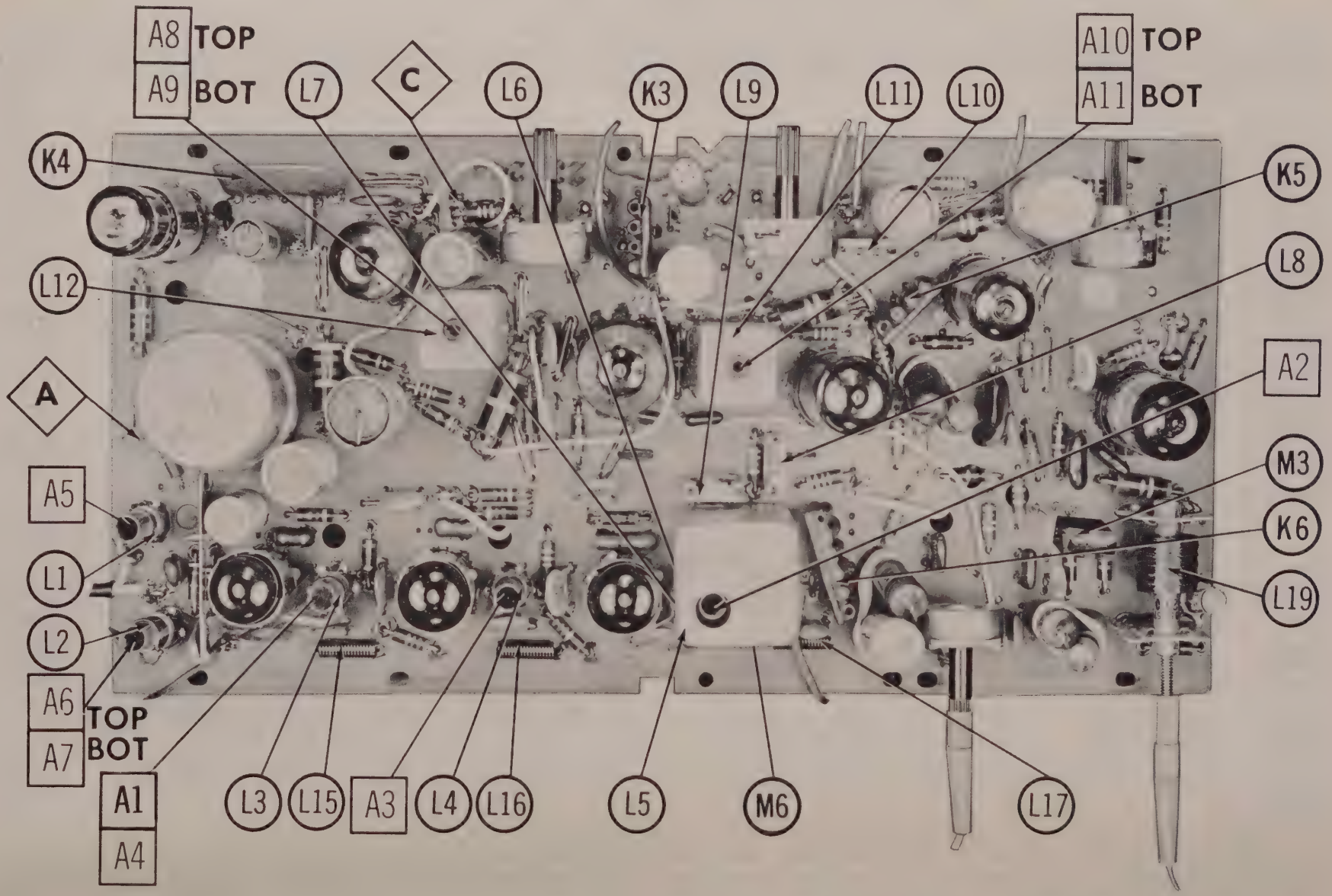
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	710-0034	Models 21C616, 21C621, 21T305
Safety Glass	715-0025	Models 21C414, 21C519, 21C524, 21T218
Safety Glass	715-0031	Models 21C529, 21C534, 21C636
Safety Glass	715-0021	Models 21C616, 21C621
Mask	716-0047	Models 21C414, 21C519 (VHF)
Mask	716-0048	Models 21C414, 21C519, (UHF-VHF)
Mask	716-0051	Model 21T218
Mask	716-0049	Model 21C524
Mask	716-0034	Models 21C616, 21C621, 21T305
Mask	716-0052	Models 21C529, 21C534, 21C626
Knob	743-0076	VHF Channel Selector, Model 21C414
Knob	743-0078	VHF Channel Selector, Model 21C519 (VHF)
Knob	743-0079	VHF Channel Selector, Model 21C519 (UHF-VHF)
Knob	743-0077	VHF Channel Selector, Model 21C414
Knob	473-0008	VHF Channel Selector, Models 21C524, 21C616, 21C621, 21T218, 21T305 (Lever Type)
Knob	740-0221	VHF Channel Selector, Models 21C529, 21C534, 21C626 (Lever Type)
Knob	743-0081	UHF Channel Selector, Models 21C529, 21C534, VHF Fine Tuning Models 21C529, 21C534, 21C626
Knob	743-0086	UHF Channel Selector, Models 21C616, 21C621, 21T305
Knob	740-0215	UHF Channel Selector, Models 21T218, 21C524, 21C616, 21C621, 21T305
Knob	740-0217	UHF Channel Selector, Models 21C414, 21C519
Knob	740-0204	VHF Fine Tuning, Models 21C414, 21C519
Knob	740-0210	VHF Fine Tuning, Models 21C524, 21T218
Knob	740-0202	VHF Fine Tuning, Models 21C414
Knob	740-0214	VHF Fine Tuning, Models 21T218, 21C524
Knob	743-0084	VHF Fine Tuning, Models 21C519
Knob	740-0218	VHF Fine Tuning, Models 21C616, 21C621, 21T305
Knob	722-0066	UHF Dial
Knob	493-0133	Volume, Contrast (Includes cable assy.) Models 21C414, 21C519
Knob	740-0209	Volume, Contrast, Brightness , Models 21T218, 21C524
Knob	740-0157	Volume, Contrast, Brightness, Models 21C616, 21C621, 21T305
Knob	740-0216	Control (6 used) Model 21C626
Knob	740-0212	Control (4 used) Models 21C529, 21C534
Knob	740-0237	Brightness, On-Off, Model 21C519
Knob	740-0206	Vert. Hold
Knob	473-0007	On-Off (Lever Type) Models 21T218, 21C524
Knob	473-0008	On-Off (Lever Type) Models 21C616, 21C621, 21T305
Knob	748-0008	Dummy, Model 21C414
Knob	744-0053	HaloLight, On-Off, Models 21C616, 21C621, 21T305
Dial Assembly	722-0067	Includes wheel, Models 21C616, 21C621 21T305 (VHF)
Dial Assembly	722-0068	Includes wheel, Models 21C616, 21C621, 21T305 (UHF-VHF)
Window	489-0029	Channel Indicator, Models 21C529, 21C534

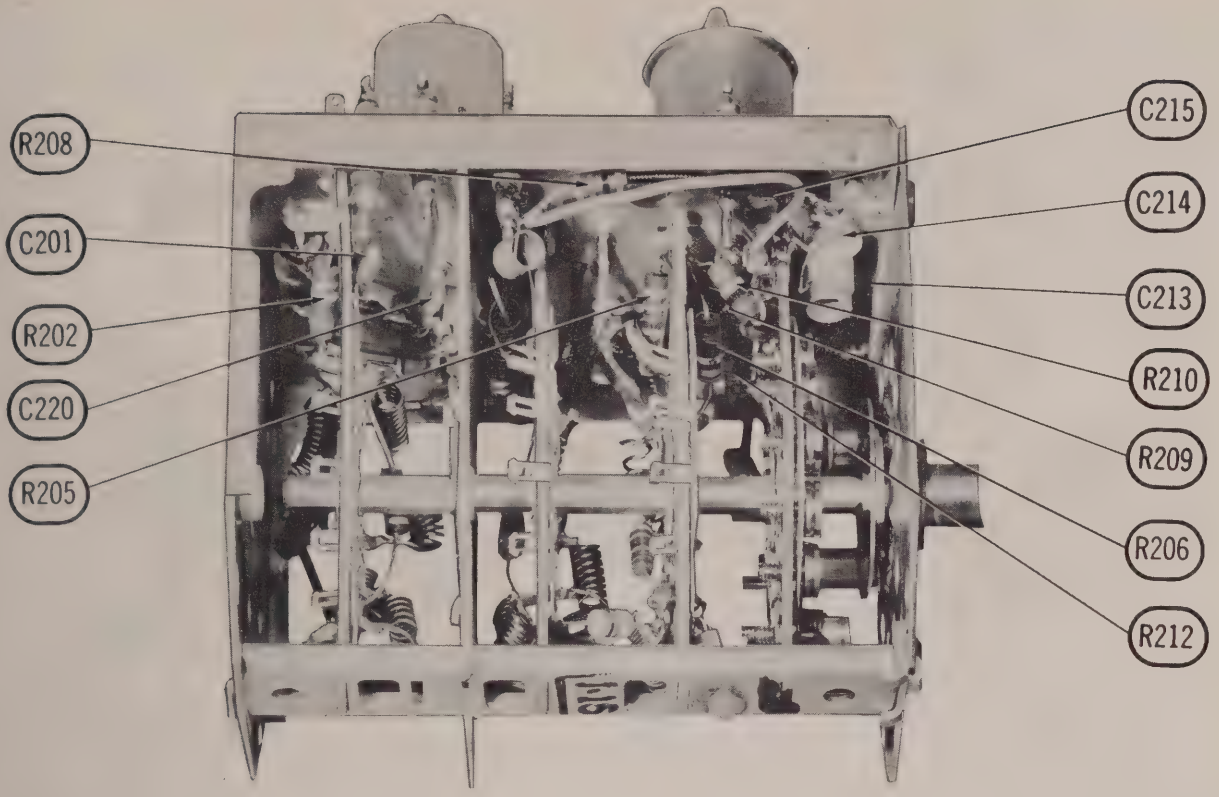
WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

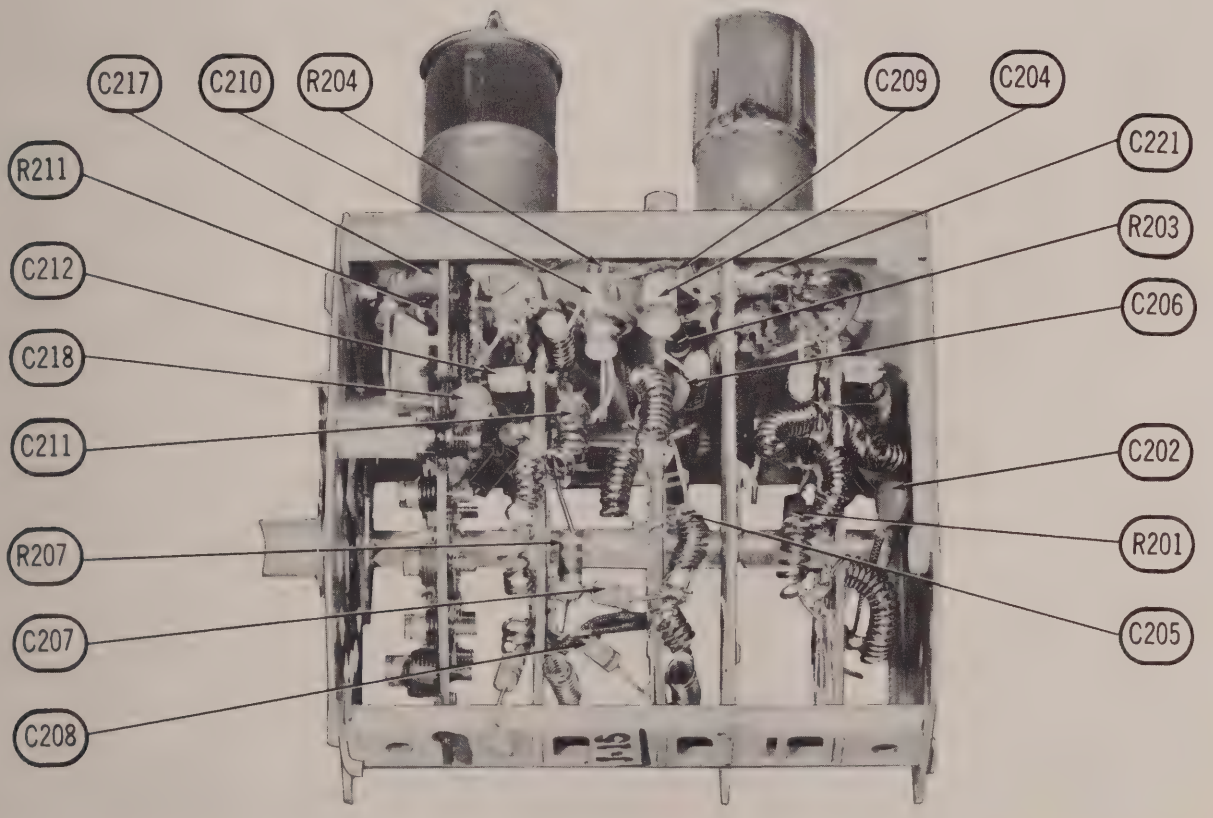
PRINTED BOARD - RESISTOR IDENTIFICATION



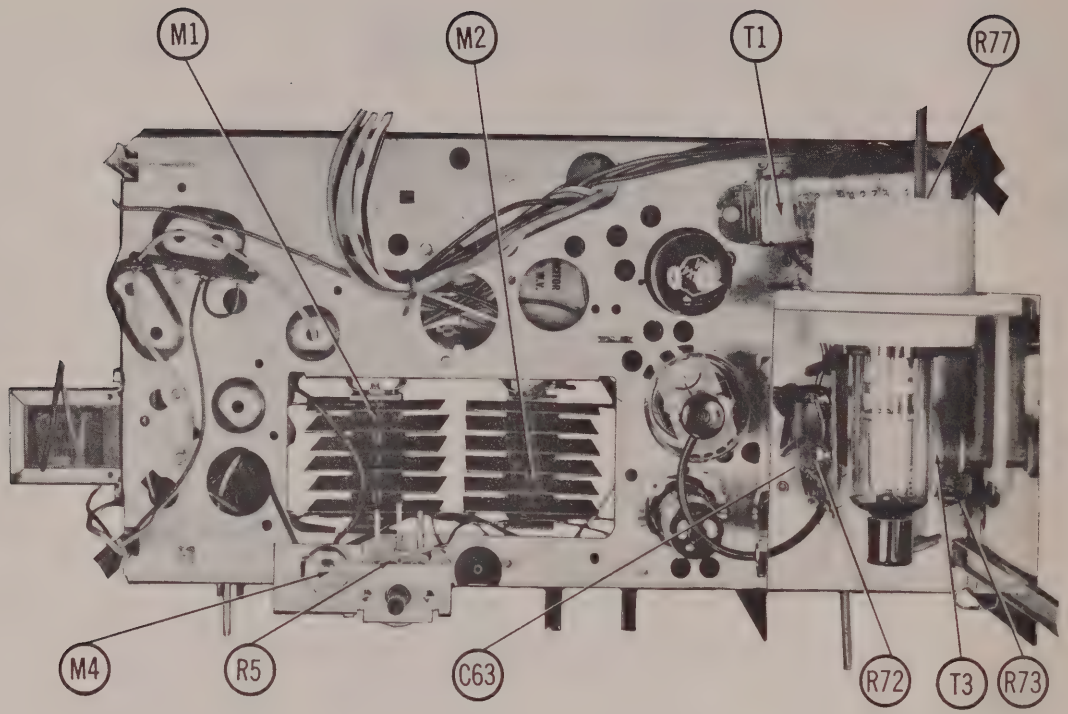
PRINTED BOARD - ALIGNMENT, INDUCTOR & MISC. IDENTIFICATION



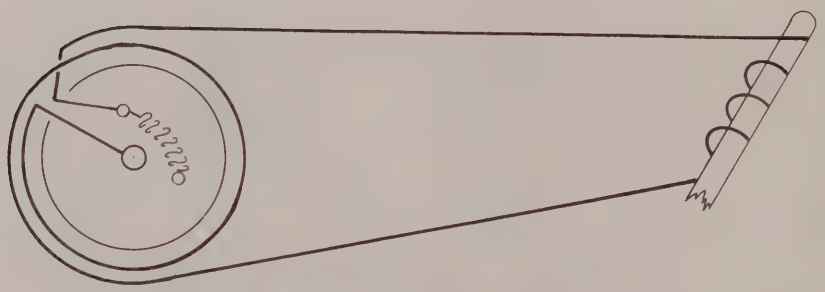
TUNER 323-0093 (54-84361-5) - LEFT SIDE



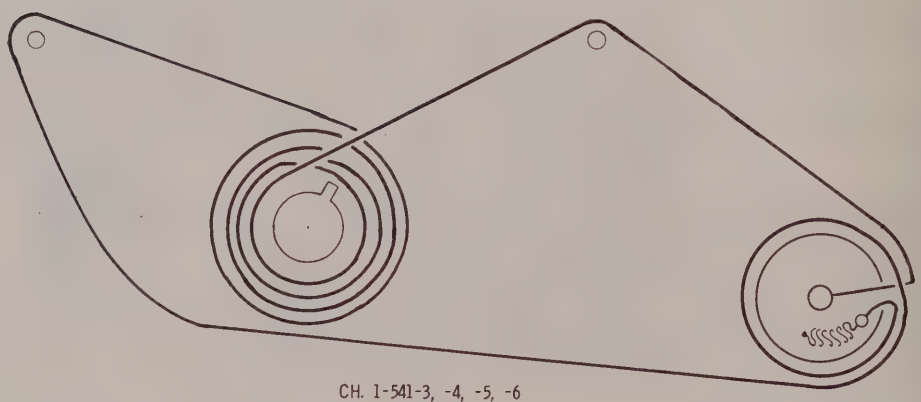
TUNER 323-0093 (54-84361-5) - RIGHT SIDE



CHASSIS-TOP VIEW

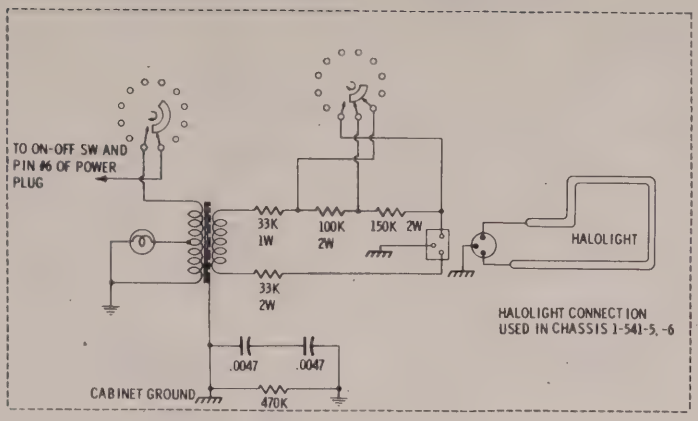


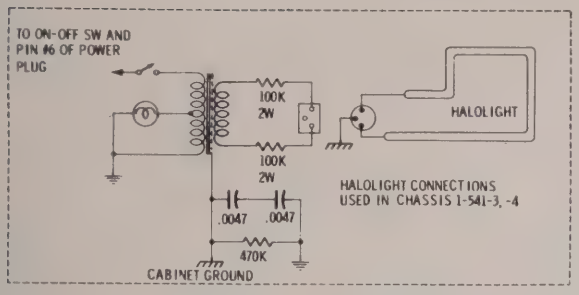
CH. 1-542-1, -2, -3, -4, -5, -6

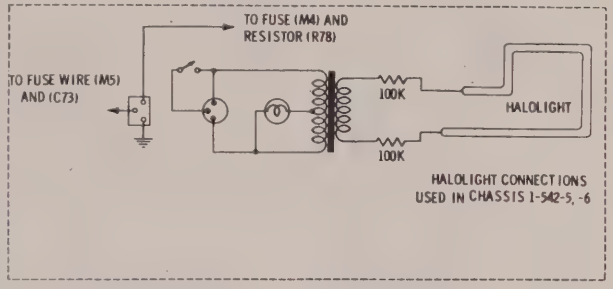


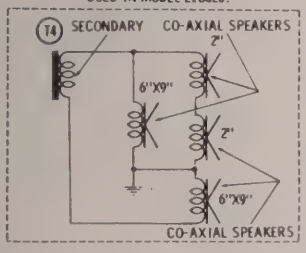
CH. 1-541-3, -4, -5, -6

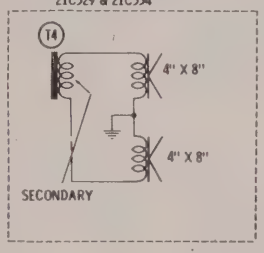
UHF DIAL STRINGING

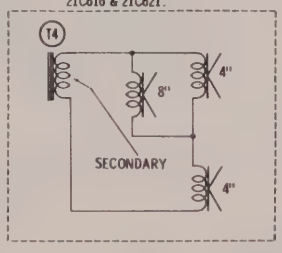


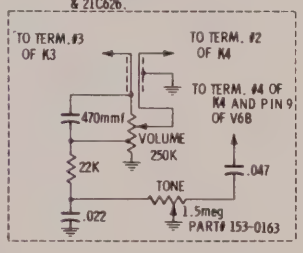


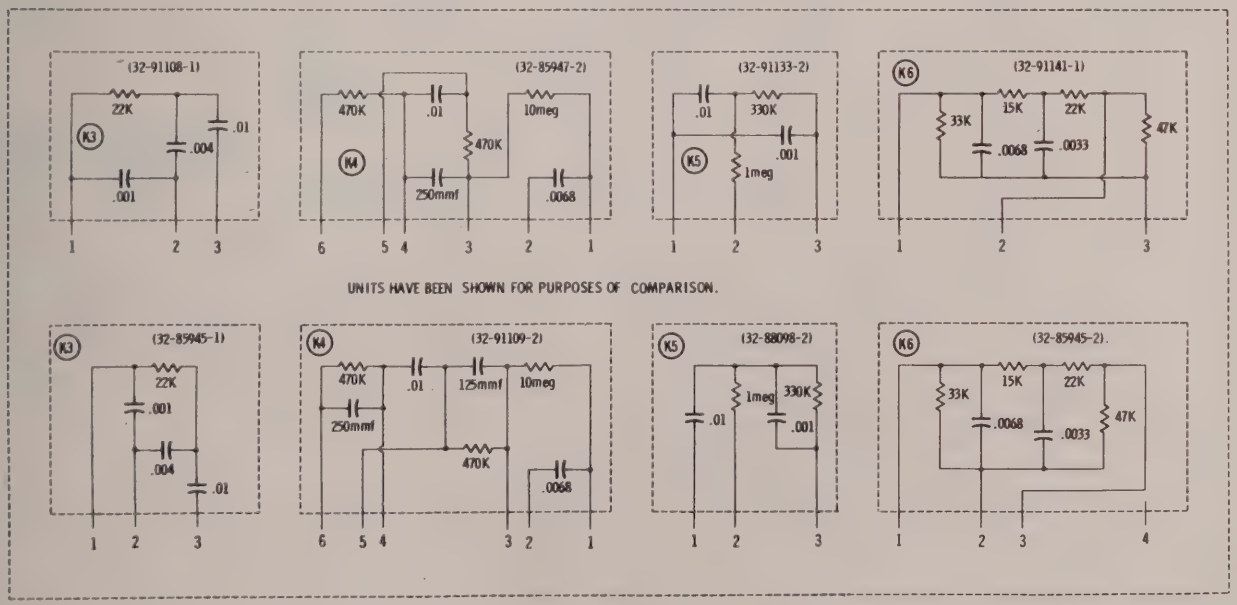












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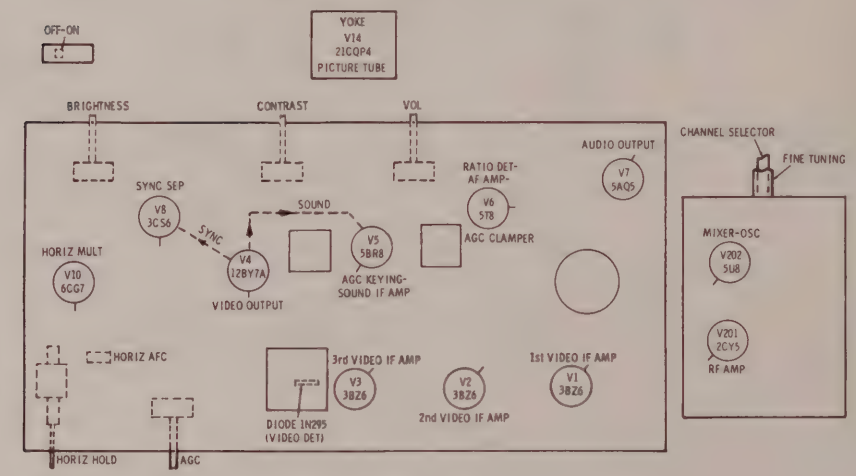
ALTERNATE SCHEMATICS

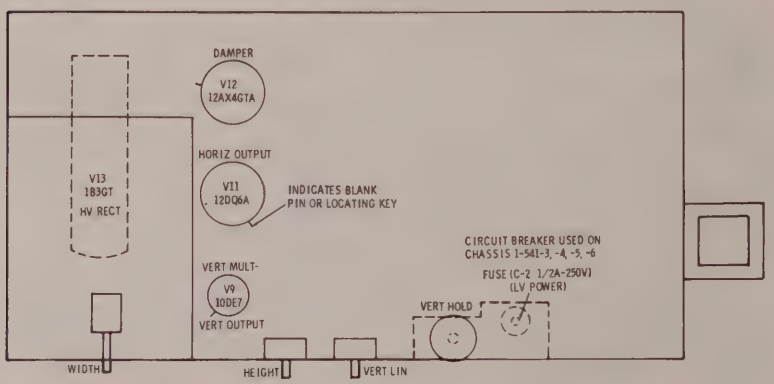
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	320K	47Ω	9.5Ω	9Ω	†1860Ω	†1860Ω	0Ω		
V2	3BZ6	.4Ω	180Ω	9Ω	8.5Ω	†1860Ω	†1860Ω	0Ω		
V3	3BZ6	.2Ω	180Ω	8.5Ω	8Ω	†2860Ω	†2860Ω	0Ω		
V4	12BY7A	27Ω	3300Ω	0Ω	5Ω	5Ω	3.5Ω	†6000Ω	†1390Ω	0Ω
V5	5BR8	†40K	180K	• †45K	3.5Ω	2.5Ω	†15K	†15K	150Ω	10K
V6	5T8	INF	27K	INF	1Ω	0Ω	550K	0Ω	10meg	†470K
V7	5AQ5	470K	270Ω	2.5Ω	1Ω	†970Ω	†470Ω	†470K		
V8	3CS6	†1meg	0Ω	6.5Ω	6Ω	†30K	†7000Ω	1.3meg		
V9	10DE7	†200Ω	•1.2meg	• 1.2meg	14Ω	11.5Ω	• †1.7meg	•1.4meg	0Ω	150Ω
V10	6CG7	†10K	1.6meg	1000Ω	6.5Ω	8Ω	†47K	120K	1000Ω	0Ω
V11	12DQ6A	NC	20Ω	TP	†8200Ω	1meg	TP	17Ω	0Ω	TOP CAP ♣12.8Ω
V12	12AX4GTA	NC	TP	¶1meg	NC	†48Ω	TP	17Ω	14Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ♣ 270Ω
V14	21CQP4	NC	•440K	6Ω	5Ω	35K	♣ 680K	♣680K		
V201	2CY5	550K	0Ω	9.5Ω	10Ω	†1200Ω	†9000Ω	0Ω		
V202	5U8	†10K	150K	†11K	10Ω	11.5Ω	†2200Ω	0Ω	0Ω	10K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

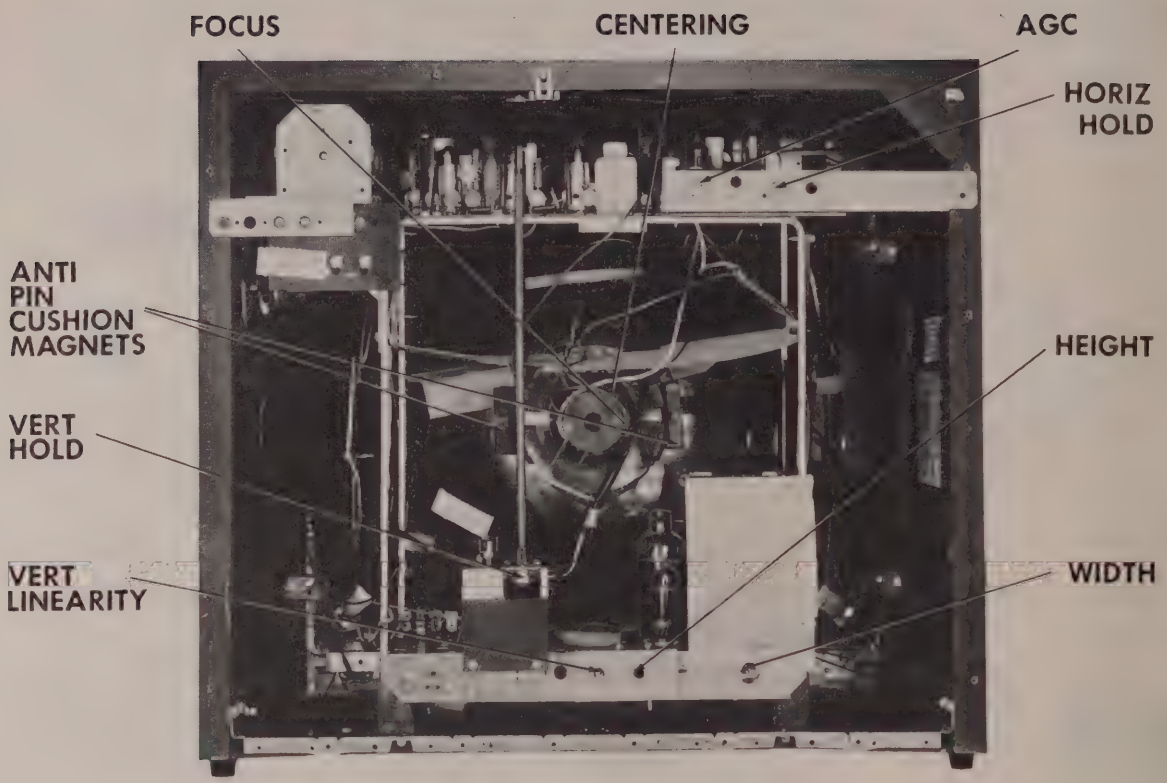
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 255V SOURCE. NC NO CONNECTION.
♣ MEASURED FROM PIN 3 OF V12. TP TIE POINT.



BOTTOM VIEW



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Adjust Width slug (B1) for picture slightly wider than necessary to fill picture mask horizontally.

PHOTOFACT* Folder

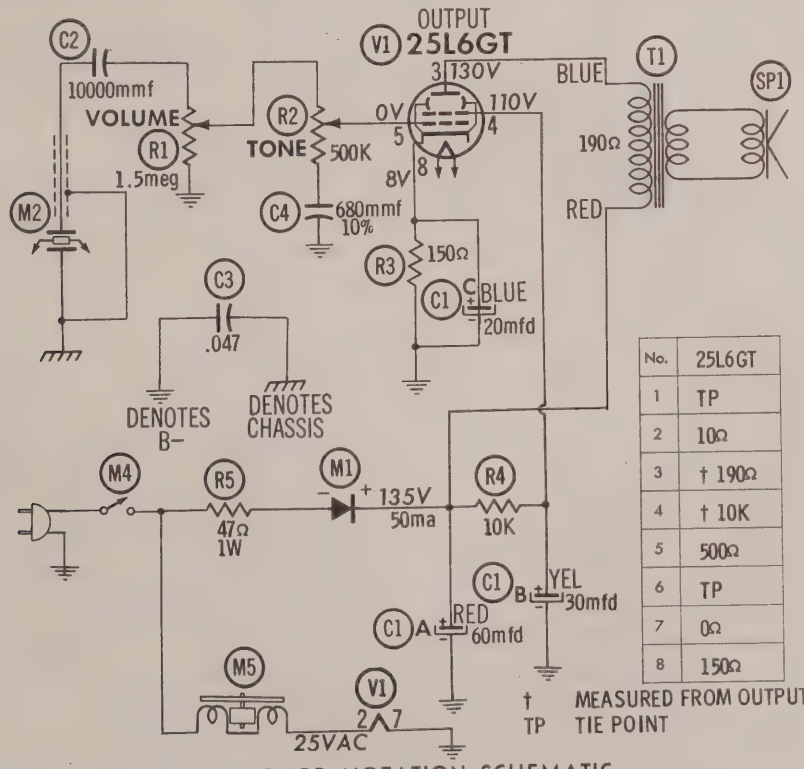
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ADMIRAL MODEL 329 (Ch. 1F1)

ADMIRAL MODEL
329 (Ch. 1F1)

TRADE NAME	Admiral Model 329 (Ch. 1F1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland Street, Chicago 47, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .41 Amp. @ 117 Volts AC(42 Watts) Less Motor

FOR SERVICE INFORMATION ON RECORD CHANGER RC 618-10H - SEE ADMIRAL RC 607-1 - PHOTOFACT SET 398 FOLDER 7



No.	25L6GT
1	TP
2	10Ω
3	† 190Ω
4	† 10K
5	500Ω
6	TP
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H762

SET 427 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	67B23-8	PRS150/25V	BBRT5315C	TCT3107	TDLT-15	FMT-327	TVA-3430
B	30	150		5030/20					
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		65D10-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C3	.047	400	65A13-5	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C4	680		65D10-172		D6-681	1R5T68		MS-368	10%

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1.5meg	½	75D1-101	B-76				Volume
R2	500K	½	75D1-102	B-59				Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R3	150Ω		60B8-151	
R4	10K		60B8-103	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R5	47Ω	1	60B14-470	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2100Ω	3-4Ω	79D33-17	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	78B110-3	52A1	

SELENIUM RECTIFIER

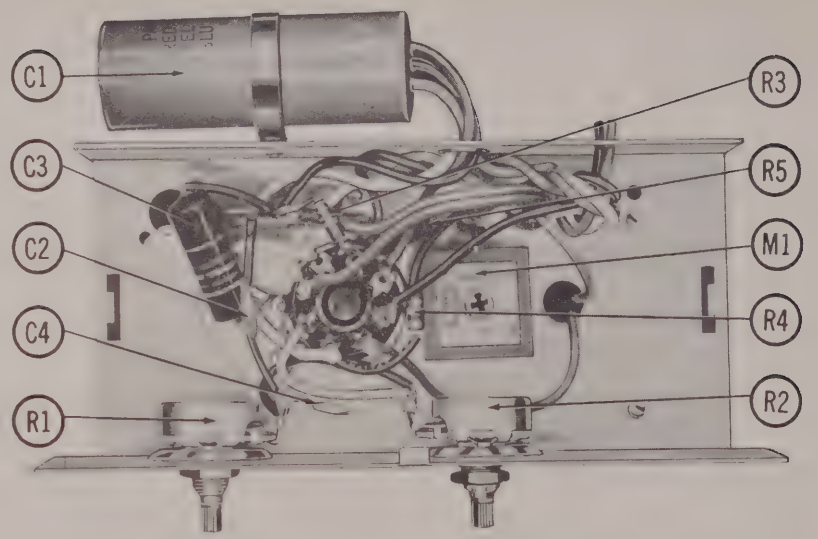
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	ADMIRAL PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.047A	93B1-6	1234AH	RS065 SD-92 ①	65 K200 ①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ADMIRAL PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	409B29 ①	420-TS	N8-1 & N8-3			① Includes needles

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	JENSEN PART No.	WALCO PART No.	
M3	98C15-90 (78)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	98C15-91 (LP)	† CRA-55LP or ♦CRA-55LPD	† W-64MGS or ♦ W-64MGD	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Switch	408A1	Record Changer, On-Off
M5	Motor	407C24-9	4 Speed, 90 Volt
	Kit	98C15-72	50 Cycle Conversion for M5

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33C81-22	Two used
Handle	35E423-54	
Cabinet	35E423-1	Less Hardware & Handle

WIRING DATA

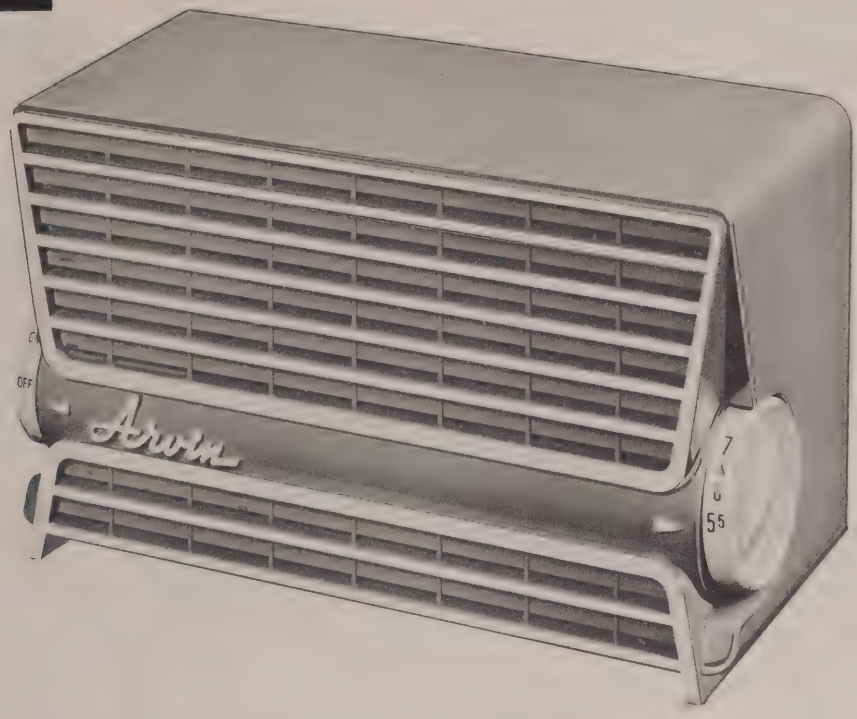
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ARVIN MODEL 2581 (Ch. 1.43800)

ARVIN MODEL
2581 (Ch. 1.43800)



ARVIN MODEL
2581 (Ch. 1.43800)

TRADE NAME	Arvin Model 2581 (Ch. 1.43800)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
RATING	.24 Amp. @ 117 Volts AC (27 Watts)
TUNING RANGE	BROADCAST 540-1670 KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Suggested Alignment Tools:

A1, A2, A3, A4, A6..... General Cement #8606
Walsco #2453

A5, A7..... General Cement #5004, 8195, 8728, 8728-A, 8729, 9291, 9294
Walsco #2520, 2522, 2525, 2531, 2532, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat Steps 2 & 3.
4.		"	1400KC	Tune for 1400KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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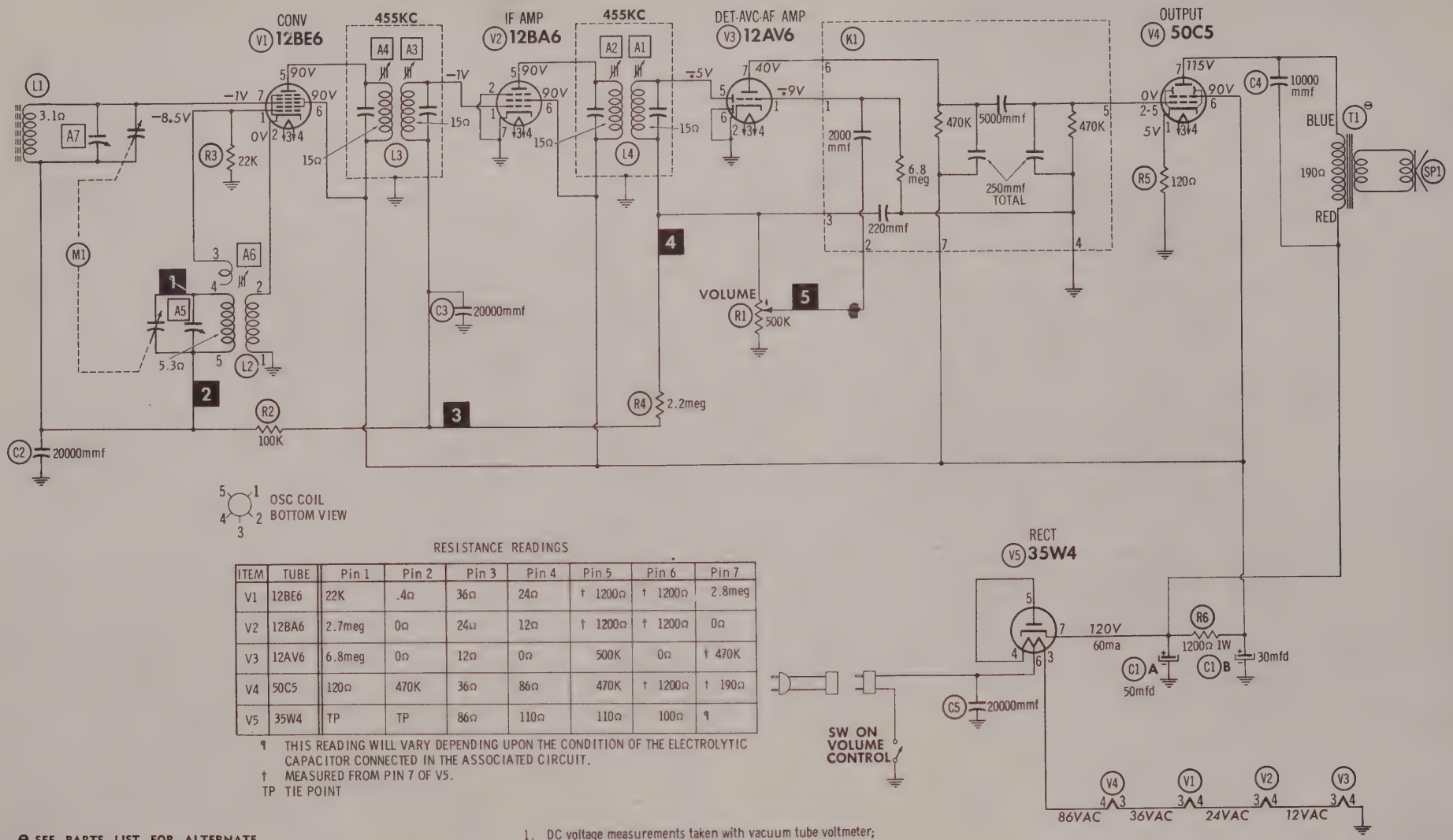
SET 427 FOLDER 4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	36Ω	24Ω	† 1200Ω	† 1200Ω	2.8meg
V2	12BA6	2.7meg	0Ω	24Ω	12Ω	† 1200Ω	† 1200Ω	0Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	† 470K
V4	50C5	120Ω	470K	36Ω	86Ω	470K	† 1200Ω	† 190Ω
V5	35W4	TP	TP	86Ω	110Ω	110Ω	100Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ARVIN MODEL 2581 (Ch. 1.43800)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	44328-4	PRS150V5030	BBRD5315	WD210	TDLD-8	CADP-512	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	20000			BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C3	20000			BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C4	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	20000			BPD-02	DD-203	BYB6S2	B-120	5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	45250-1					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ARVIN PART No.	NOTES
	OHMS	WATT		
R2	100K			
R3	22K			
R4	2.2meg			

ITEM No.	RATING		ARVIN PART No.	NOTES
	OHMS	WATT		
R5	120Ω			
R6	1200Ω	1		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARVIN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	45192-1					Includes Cabinet Back
L2	Osc. Coil	43644-1					
L3	1st IF	44282-1	16-6780	BC-356	13-PC9	RF-4	
L4	2nd IF	44282-1	16-6780	BC-357	13-PC10	RF-4	

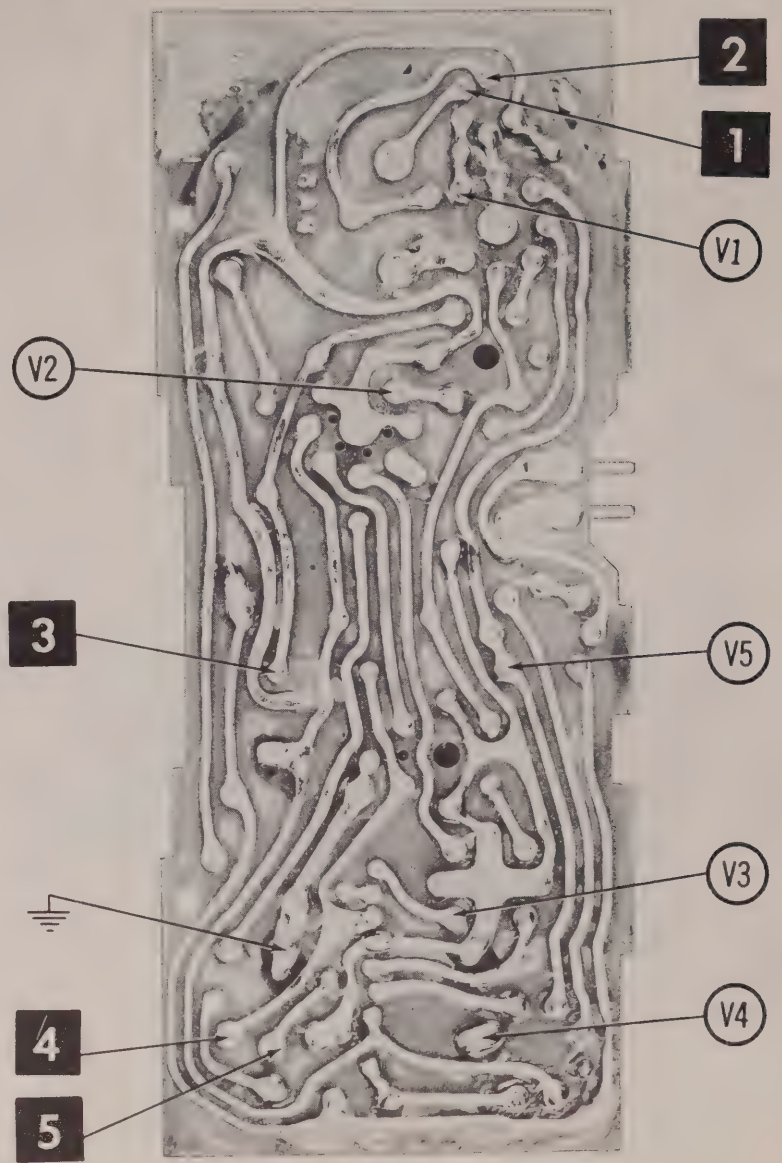
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	42700-20 ①	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	① Alternate Part #42700-21

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	45600-1	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA	
K1	Audio Circuit	220mmf, 250mmf, 250mmf, 2000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovax Centralab Sprague	PA-512-3 PC-158 DT-5

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap. Printed Board	45252-1 45295-1	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

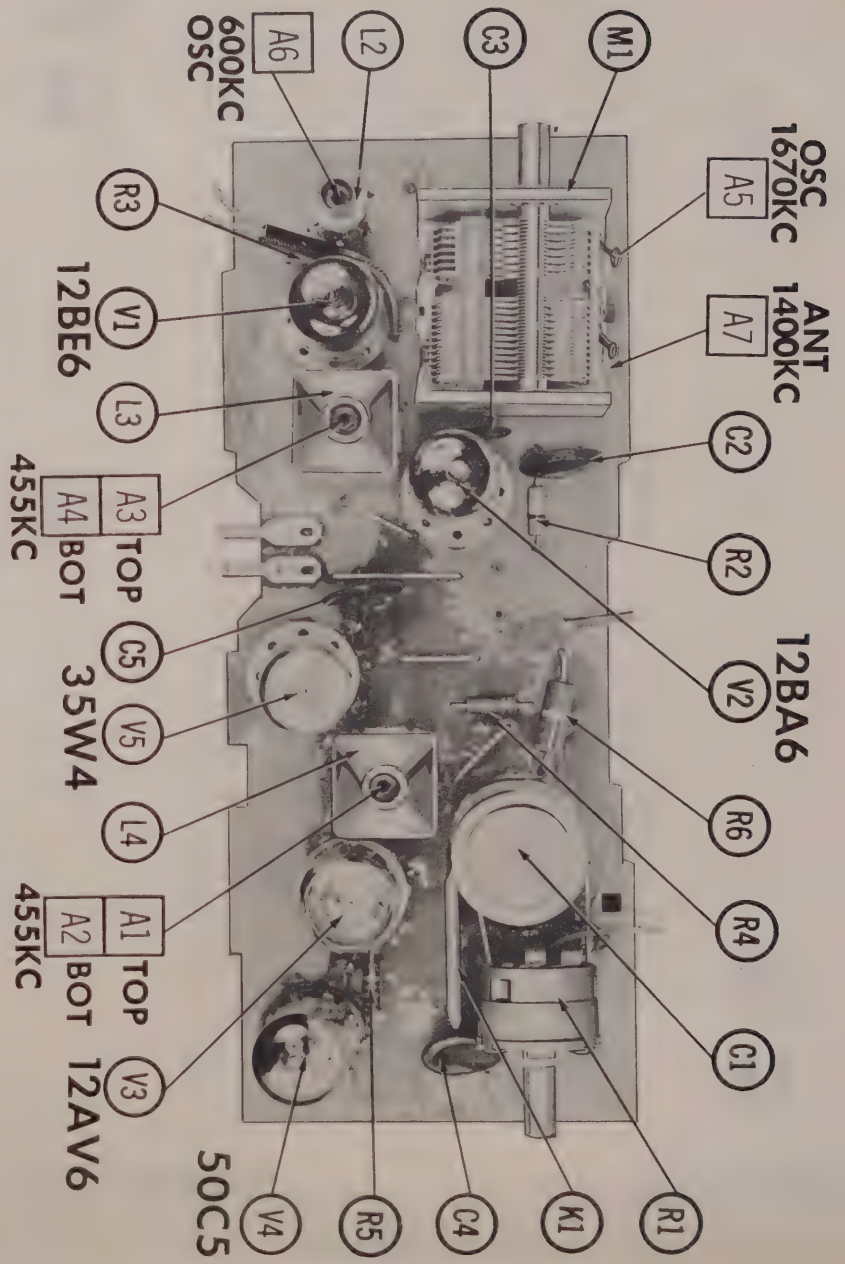
NAME	PART NO.	DESCRIPTION
Knob	45246-17	Tuning
Knob	45247-17	On-Off-Volume
Cabinet	45279-73	Flame
Cabinet	45279-19	Charcoal

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



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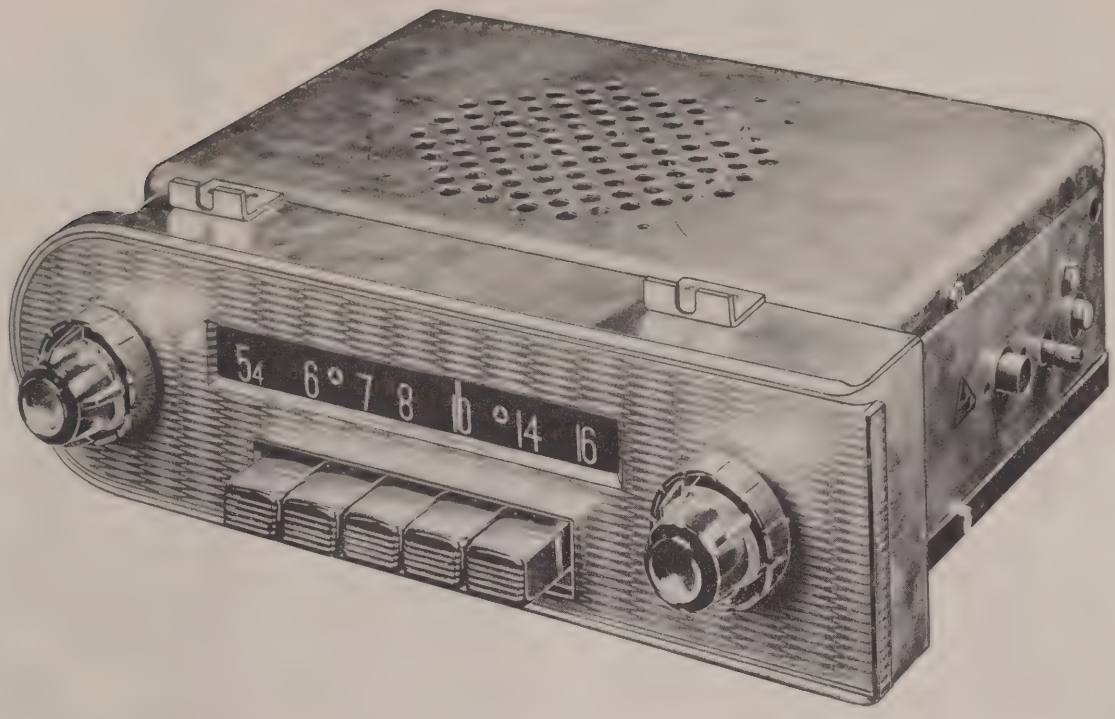
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

AUTOMATIC
MODEL NY-598A

AUTOMATIC
MODEL NY-598A



AUTOMATIC
MODEL NY-598A

TRADE NAME	Automatic Model NY-598-A (For 1958 Chrysler Automobiles)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Four)	Types 12CX6 (or) 12BL6 (or) 12AF6 RF Amplifier, 12AD6 Converter, 12AF6 IF Amplifier, 12AE6 Det. - AVC - AF Amplifier
POWER SUPPLY	12 Volt Storage Battery
RATING	1.1 Amp. @ 12.6 Volts DC
TUNING RANGE--BROADCAST	538 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400∿ Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1600KC	1600KC	"	A5	"
3.	68mmf	High side to antenna receptacle. Low side to chassis.	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	"	"	600KC	600KC	"	A8, A9, A10	Adjust for maximum output. Repeat steps 2, 3, and 4.
5.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull out pushbutton; then push in firmly.
3. Repeat for remaining buttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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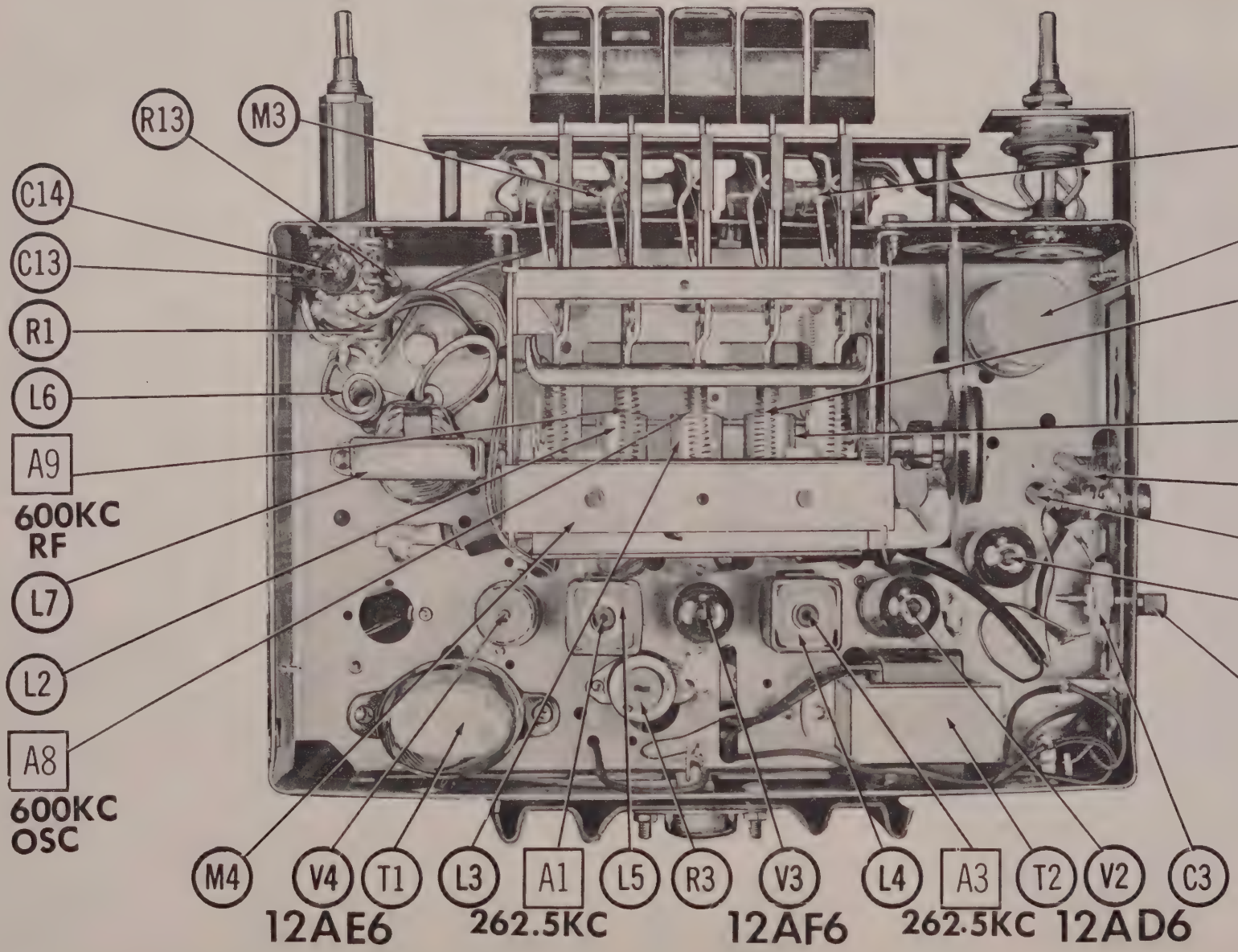
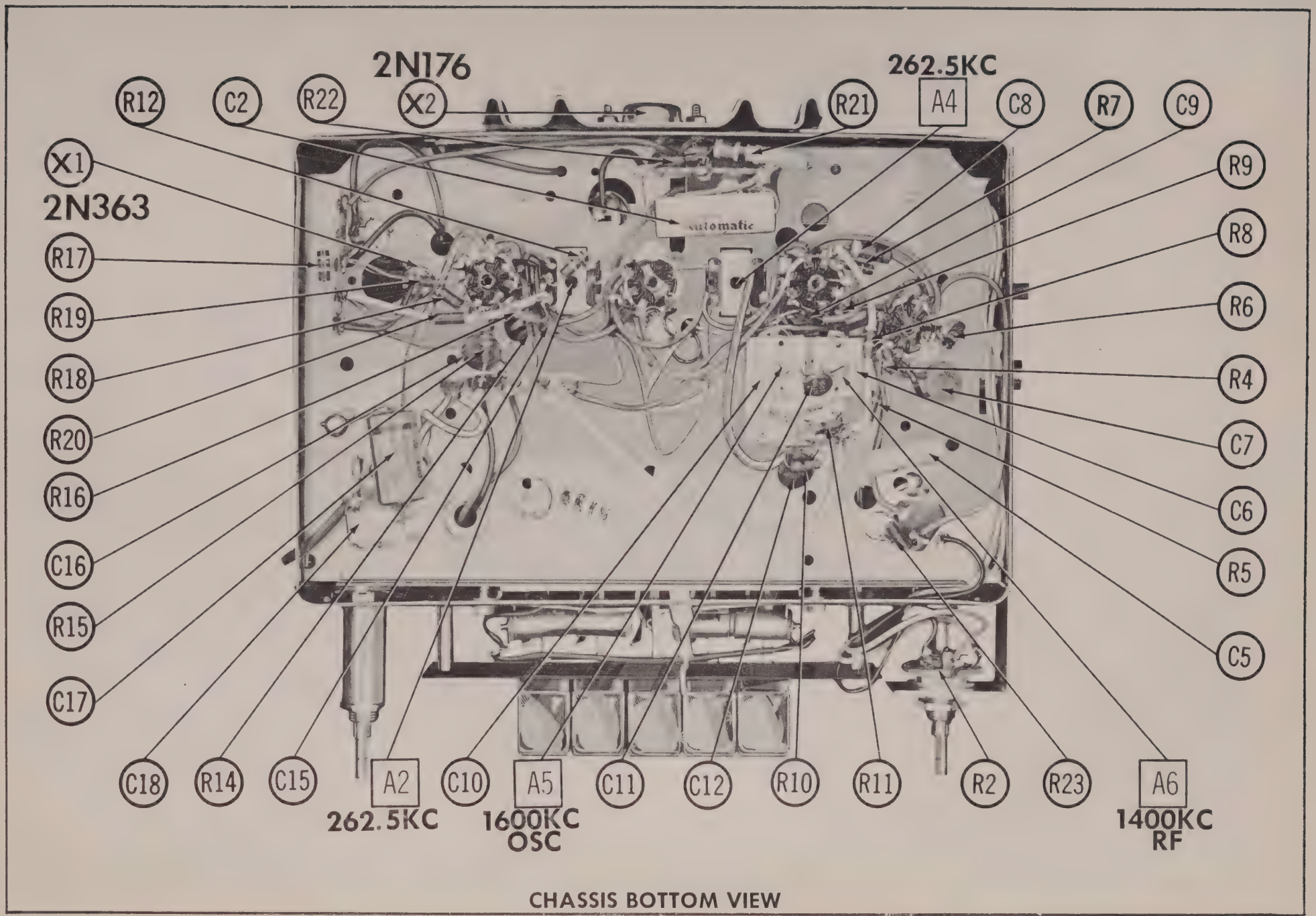
H759

SET 427 FOLDER 5



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		AUTOMATIC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	†					
L2	RF Coil	†					
L3	Osc. Coil	†					
L4	Input IF	14-265	16-6752	BC-350	12-H1	RF-3	
L5	Output IF	14-267	16-6754	BC-354	12-H6		
L6	"A" Lead Choke						1.3 Microhenries ①

† Part of Tuner Assembly M4. ① Not used in some versions.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1.2A	9Ω	.008 Hy.	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8	: 1	75A702C						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	13Ω	3-4Ω	75A805							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	5" x 7"	PM	3-4Ω	73A654 ①	57A21	① Alternate Part #73B654

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	AGW	7½A 32V	108-100		30107.5 (AGW 7½A 32V)	155004	SFE7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2	Lamp	1891	#1891
M3	Lamp	1891	#1891 (Not used in some versions)
M4	Tuner	77-448	Pushbutton Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A646	Tuning, On-Off-Volume
Knob	48A648	Tone, Speaker Balance
Cover	52B670	Case, Top
Dial Scale	39B697	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12CX6	Note 1
V2	Converter	12AD6	
V3	IF Amplifier	12AF6	
V4	Det. - AVC - AF Amp.	12AE6	

Note 1. Alternate types: 12BL6 or 12AF6

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363	Driver			2N363	2N383	PNP Note 1
X2	2N176	Output	CBS-2N155			2N176	PNP Note 2

Note 1. Alternate Type CK872 or equivalent. Note 2. Alternate Type CT1122 or equivalent.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲150	15	20-315	AFH2-02-75	B0045	WP200.7			R2699 *
B	■500	15							
C2	750	3	20-757						R2701 *

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3			28-800						
C4	40		15-400	NPO-DI 39		C10Q39C		5TCC-Q39	NPO
C5	.047	200	30-473-2	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C6			28-400						
C7	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2	①
C8	12			SI 12	D6-120	L10Q12	UC-5412	5GA-Q12	②
C9	40		15-400	NPO-DI 39		C10Q39C		5TCC-Q39	NPO
C10			28-281						
C11	51		15-510N			C10Q51U			N750 10%

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C12	10000		15-103	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C13	3000			BPD-003	DD-302	BYA10D3	UC-523	5HK-D3	③
C14	10000		15-103	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C15	27		15-270	DI 27	DD-270	L10Q27	UC-5427	5GA-Q27	
C16	10000		15-103	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C17	.5	100		P288N-47		CUB2P5	GEM-205	2TM-P5	④
C18									

① Not used in some versions.
② Some versions may use 5mmf or 27mmf (Part #15-270) in this application.
③ Some versions may use 2000mmf in this application.
④ Some versions may use .47mfd in this application (Part #39-474-1).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	80A700	F1-68 †				Tone
B	1meg	½		R2-60				Volume, Tap ② 500K
C	Switch			KB-4 or KR-4*				
R2	25Ω	2(WW)	80A753					Speaker Fader
R3	500Ω	2(WW)	62-501		39-500		FL-600	Transistor Bias

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.
† Use AK-26 Adaptor Bushing.

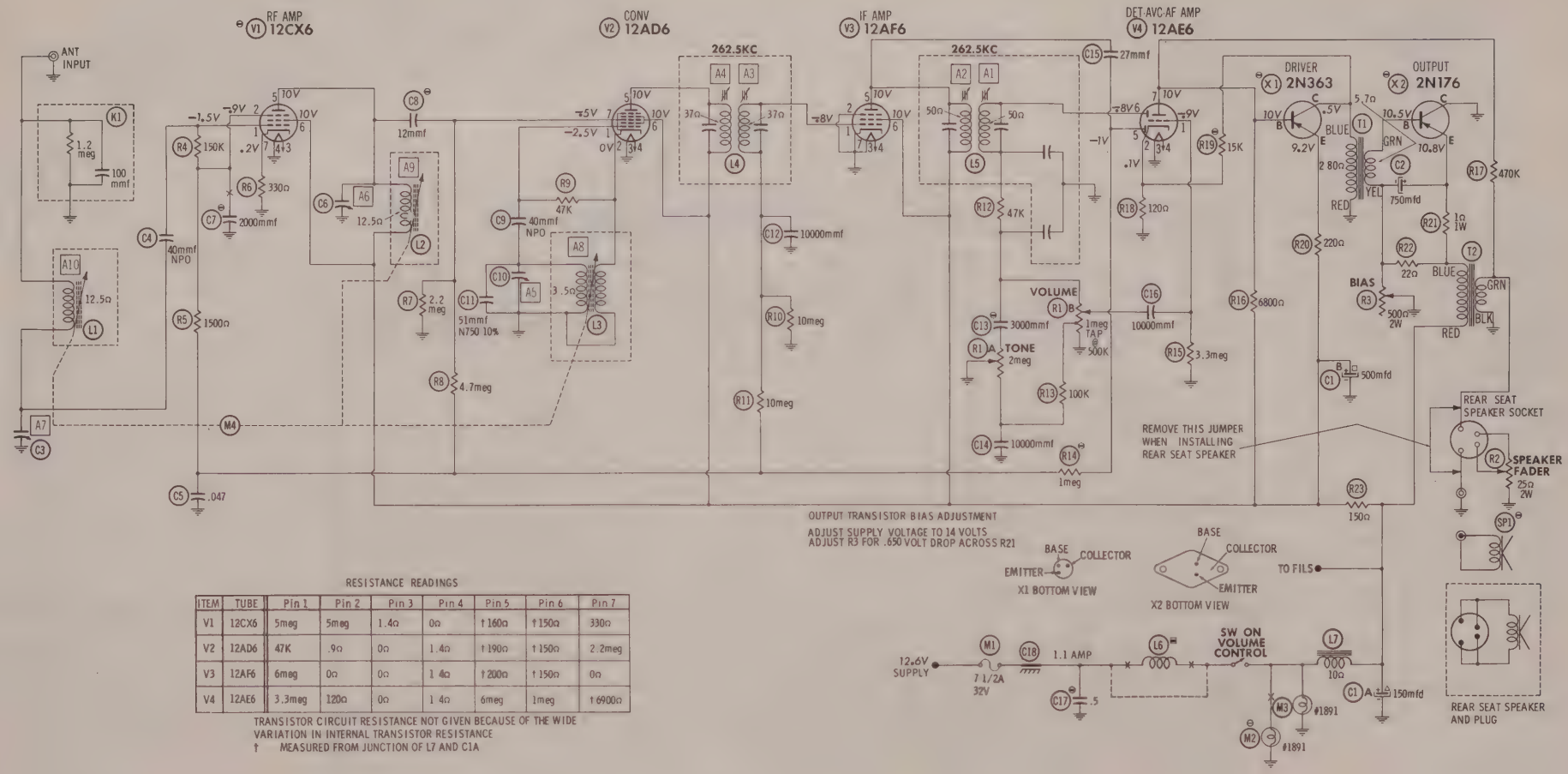
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		AUTOMATIC PART No.	NOTES
	OHMS	WATT		
R4	150K		60-154S	
R5	1500Ω		60-152S	
R6	330Ω		60-331	
R7	2.2meg		60-225S	
R8	4.7meg		60-475S	
R9	47K		60-473	
R10	10meg		60-106	
R11	10meg		60-106	
R12	47K		60-473	
R13	100K		60-104	

ITEM No.	RATING		AUTOMATIC PART No.	NOTES
	OHMS	WATT		
R14	1meg		60-105	Note 1
R15	3.3meg		60-335	
R16	6800Ω		60-682S	
R17	470K		60-474	
R18	120Ω		60-121	
R19	15K		60-153	Note 2
R20	220Ω		60-221	
R21	1Ω	1(WW)	60-1-1	
R22	22Ω		60-220	
R23	150Ω		60-151	

Note 1. Some versions may use 1.2meg in this application (Part #60-125).
Note 2. Some versions may use 12K in this application (Part #60-123).



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12CX6	5meg	5meg	1.4Ω	0Ω	†160Ω	†150Ω	330Ω
V2	12AD6	47K	.9Ω	0Ω	1.4Ω	†190Ω	†150Ω	2.2meg
V3	12AF6	6meg	0Ω	0Ω	1.4Ω	†200Ω	†150Ω	0Ω
V4	12AE6	3.3meg	120Ω	0Ω	1.4Ω	6meg	1meg	†6900Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

† MEASURED FROM JUNCTION OF L7 AND C1A

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AUTOMATIC
MODEL NY-598A

PHOTOFACT* Folder

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DAVID BOGEN MODEL KO60

DAVID BOGEN
MODEL KO60

DAVID BOGEN
MODEL KO60

TRADE NAME	David Bogen Model KO60
MANUFACTURER	David Bogen Co., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated Audio Amplifier
TUBES (Five)	Types 6U8 AF Amp.-Phase Inv., (2) 6CA7/EL34 Output, 5U4GB Rectifier, EZ81/6CA4 Rectifier
POWER SUPPLY	110-120 Volts AC-50/60 Cycles RATING .88 Amp. @ 117 Volts AC (83 Watts)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H721

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier - Phase Inverter	6U8	
V2	Output	6CA7/EL34	
V3	Output	6CA7/EL34	
V4	Rectifier	5U4GB	
V5	Rectifier	EZ81/6CA4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C2	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C3A	●10	450		AFH4-10	D0090	FP434	TMQ-10	Q-030	TVL-4760
B	■10	450							
C	▲10	450							
D	10	450							
C4	5	200		PRS250V4	BBR4-250	TC50X	TD-4-250	MT-4504	TVA-1501
C5	50	100		PRS150V50	BR5015	TC49	TD-50-150	MT-1550	TVA-1414

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.033	200		P288N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C7	1.2								
C8	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C9	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C10	3300					1R5D33		MS-233	10%
C11	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C12	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	V275B	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R2A	25K	½	V410A	AB-26	B-47-25K-S	B11-120	TA253L	Bias Adj.
B	Shaft			AK-1	Not Req.	TM1	Not Req.	

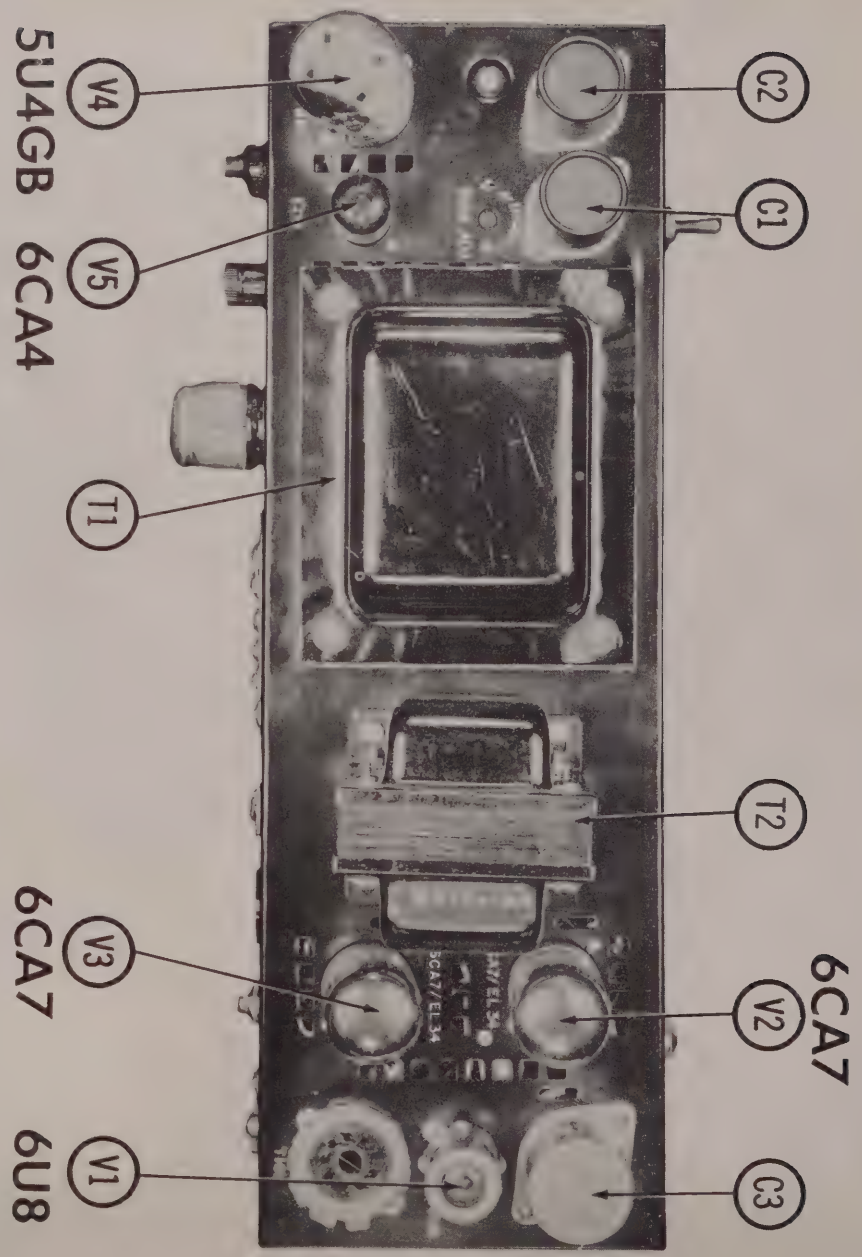
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R3	33K			
R4	470K			
R5	22K			
R6	390Ω			
R7	150K	2		
R8	12K			
R9	470K			
R10	12K			
R11	10K			
R12	390K			
R13	150K			
R14	100K			

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R15	15K			
R16	100K			
R17	15Ω			
R18	100K			
R19	1000Ω	7(WW)		
R20	15Ω			
R21	500Ω	7(WW)		
R22	33K	2		
R23	1meg			
R24	1meg			
R25	4. 7Ω			
R26	68K			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .88A	1000VCT @ .050A Taps @ 620V @ .010A	5V @ 2.5A	T3171-1						
	SEC. 3									
	6.3VCT @ 4.7A	Tap @ 40V @ .0007A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4100Ω CT	8Ω (70V) SEC. 2 16Ω Tap @ 8Ω, 4Ω	T2124-2							

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	David Bogen PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.0007A	H373	1159	D-5410	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 125V S/B			313003. (3A 125V S/B)	342001	MDX3	HKP

MISCELLANEOUS

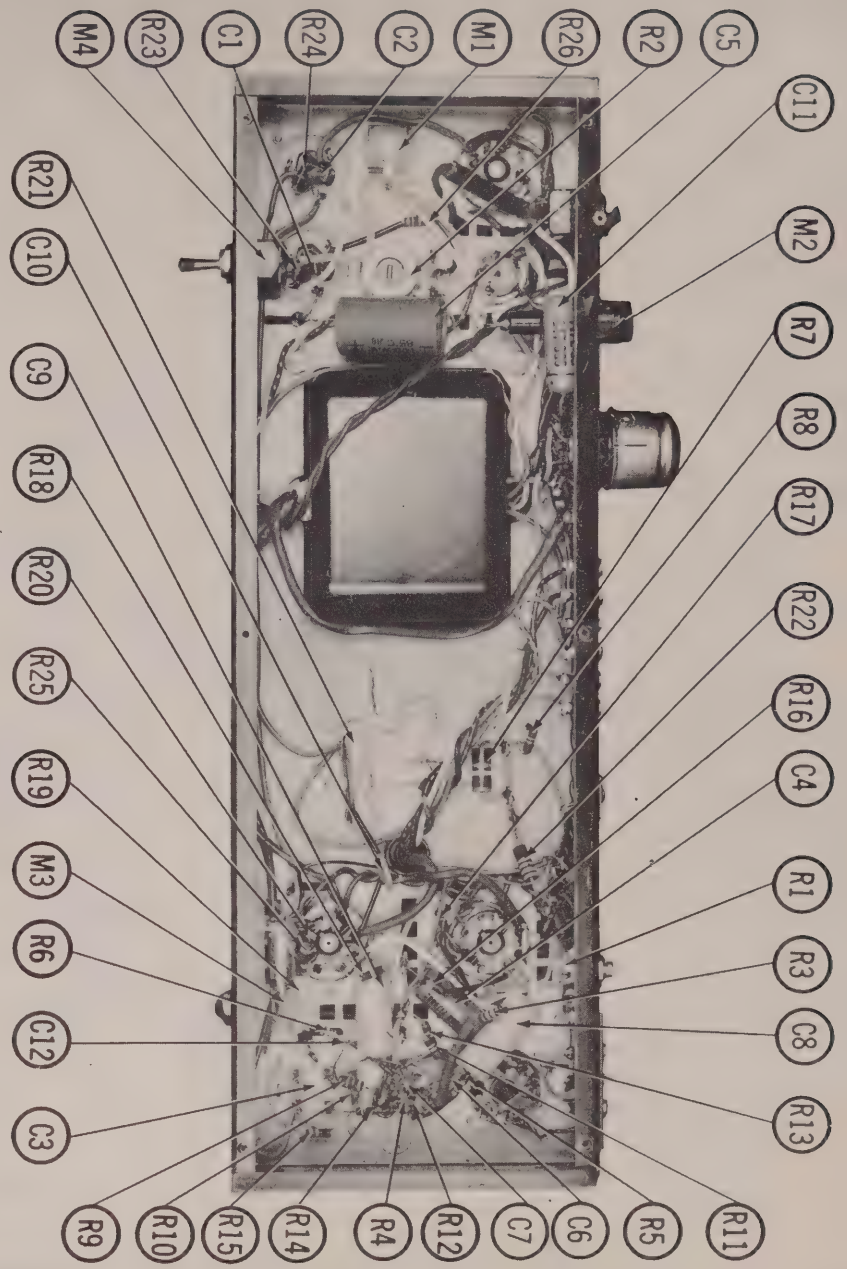
ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Lamp	·	#47
M4	Switch	S191B	Power On-Off, SPST, Toggle Type

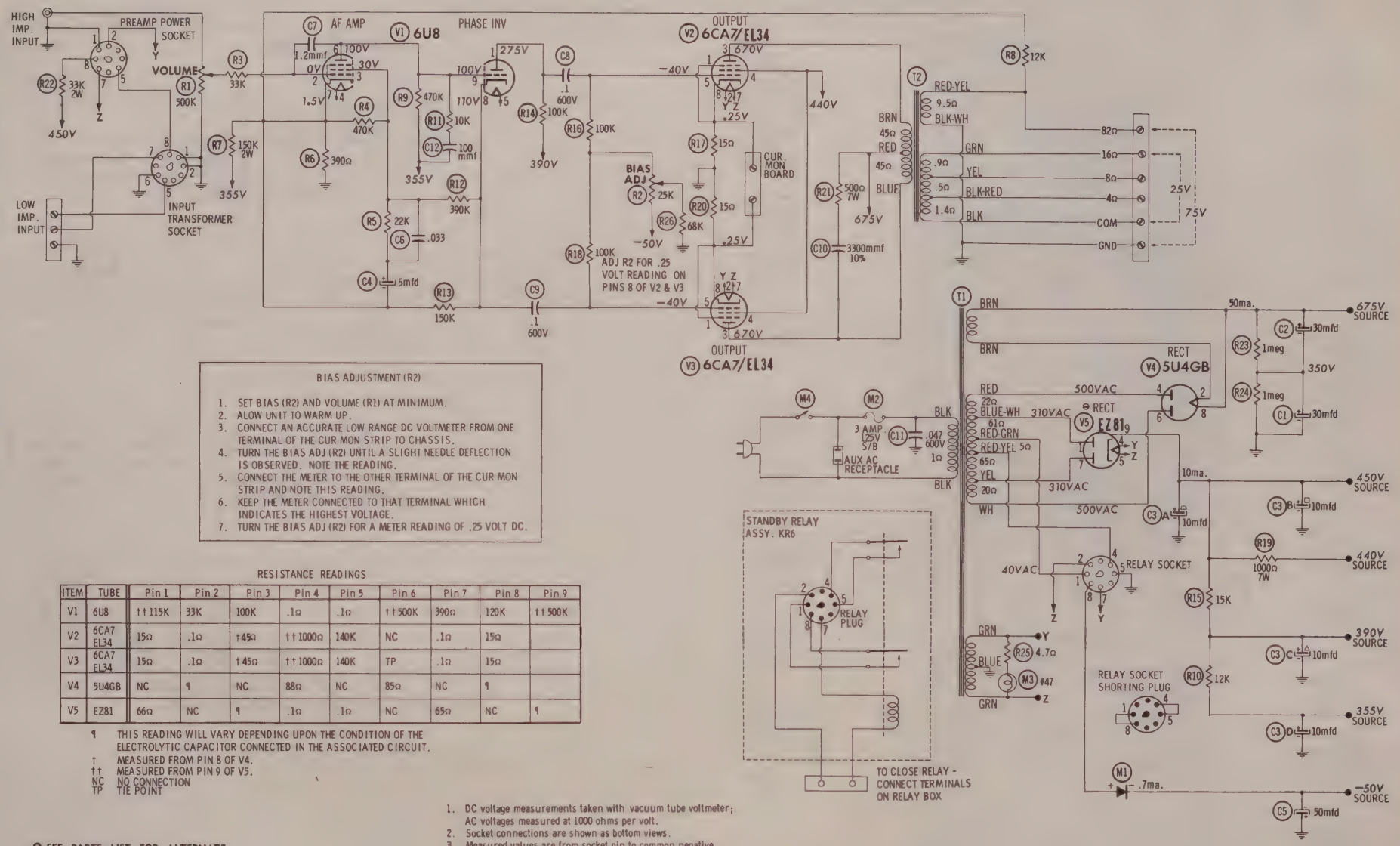
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





BIAS ADJUSTMENT (R2)

1. SET BIAS (R2) AND VOLUME (R1) AT MINIMUM.
2. ALOW UNIT TO WARM UP.
3. CONNECT AN ACCURATE LOW RANGE DC VOLTMETER FROM ONE TERMINAL OF THE CUR MON STRIP TO CHASSIS.
4. TURN THE BIAS ADJ (R2) UNTIL A SLIGHT NEEDLE DEFLECTION IS OBSERVED. NOTE THE READING.
5. CONNECT THE METER TO THE OTHER TERMINAL OF THE CUR MON STRIP AND NOTE THIS READING.
6. KEEP THE METER CONNECTED TO THAT TERMINAL WHICH INDICATES THE HIGHEST VOLTAGE.
7. TURN THE BIAS ADJ (R2) FOR A METER READING OF .25 VOLT DC.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8	††115K	33K	100K	.1Ω	.1Ω	††500K	390Ω	120K	††500K
V2	6CA7 EL34	15Ω	.1Ω	†45Ω	††1000Ω	140K	NC	.1Ω	15Ω	
V3	6CA7 EL34	15Ω	.1Ω	†45Ω	††1000Ω	140K	TP	.1Ω	15Ω	
V4	5U4GB	NC	¶	NC	88Ω	NC	85Ω	NC	¶	
V5	EZ81	66Ω	NC	¶	.1Ω	.1Ω	NC	65Ω	NC	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V4.
†† MEASURED FROM PIN 9 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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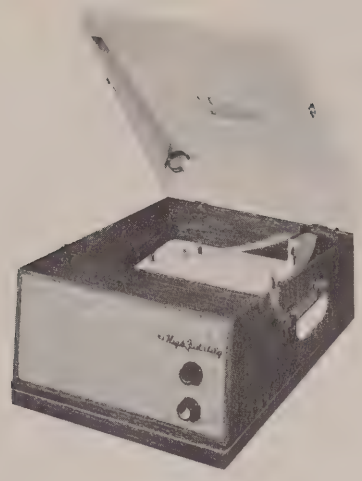
DAVID BOGEN
MODEL KO60

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

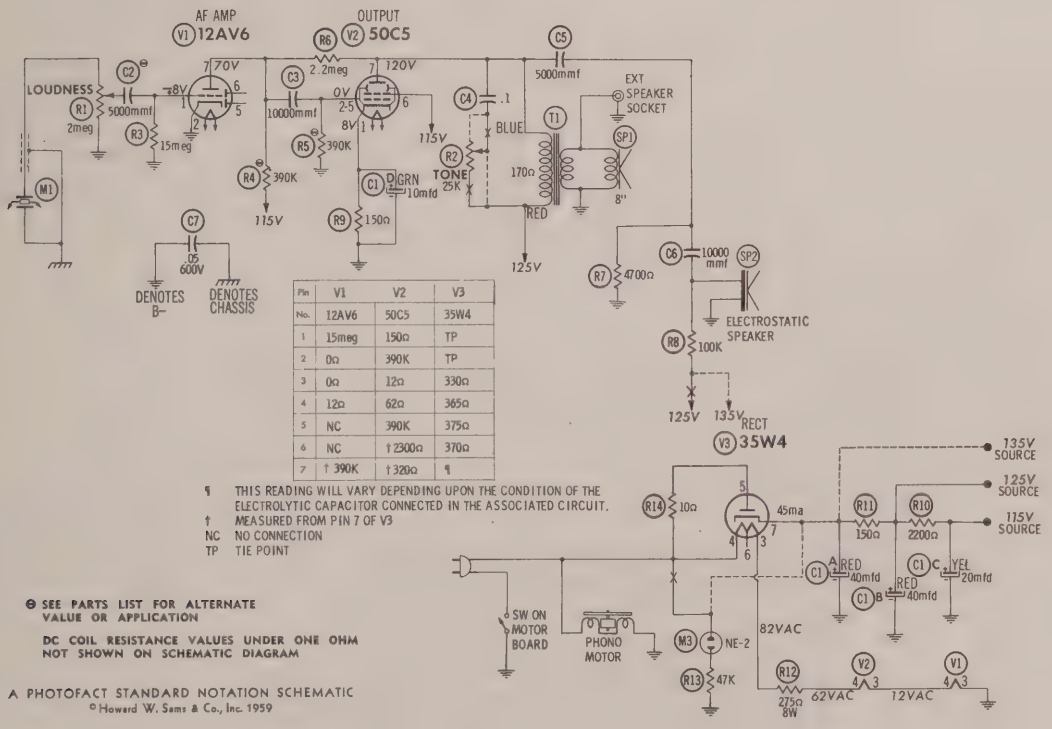
FANFARE MODEL 322VM

FANFARE MODEL 322VM



TRADE NAME	Fanfare Model 322VM
MANUFACTURER	Fanon Electric Sales Corp., 919 Park Place, Brooklyn 13, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC (23 Watts) Less Motor

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10



Pin No.	V1	V2	V3
1	15meg	150Ω	TP
2	0Ω	390K	TP
3	0Ω	12Ω	330Ω
4	12Ω	62Ω	365Ω
5	NC	390K	375Ω
6	NC	† 2300Ω	370Ω
7	† 390K	† 320Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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FANFARE MODEL 322VM

SET 427 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H784

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FANFARE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150							R2527 *
B	40	150							
C	20	150							
D	10	10							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FANFARE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	①
C3	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C4	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C5	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C6	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C7	.05	600		P688N-05	DF-503	CUB6S5	GEM-615	6TM-S5	

① Some versions may use 10000mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FANFARE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg	½	CM16669	B-76				Loudness
R2	25K	½	CM16667	B-29				Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FANFARE PART No.	NOTES
R3	15meg			
R4	390K			Note 1
R5	390K			Note 1
R6	2.2meg			
R7	4700Ω			
R8	100K			

ITEM No.	RATING OHMS	RATING WATT	FANFARE PART No.	NOTES
R9	150Ω			
R10	2200Ω			
R11	150Ω			
R12	275Ω	8		
R13	47K			
R14	10Ω			

Note 1. Some versions may use 470K in this application.

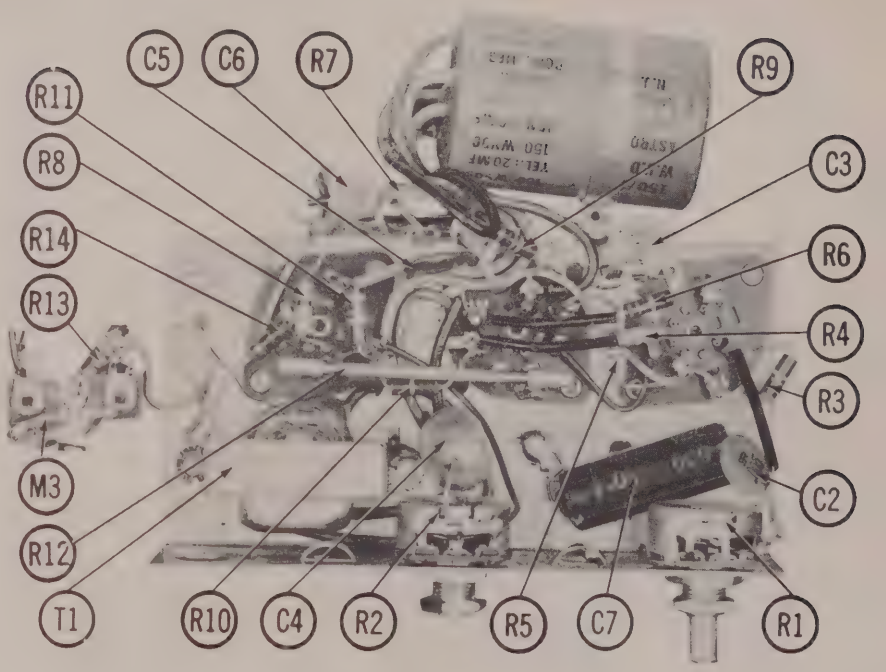
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FANFARE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3000Ω	3-4Ω	FX313	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA FANFARE PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω		8A21	
SP2	3"	Electrostatic		LSH75		

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA FANFARE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1		81-T				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA FANFARE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2				

MISCELLANEOUS

ITEM No.	PART NAME	FANFARE PART No.	NOTES
M3	Lamp		NE-2, Neon Type

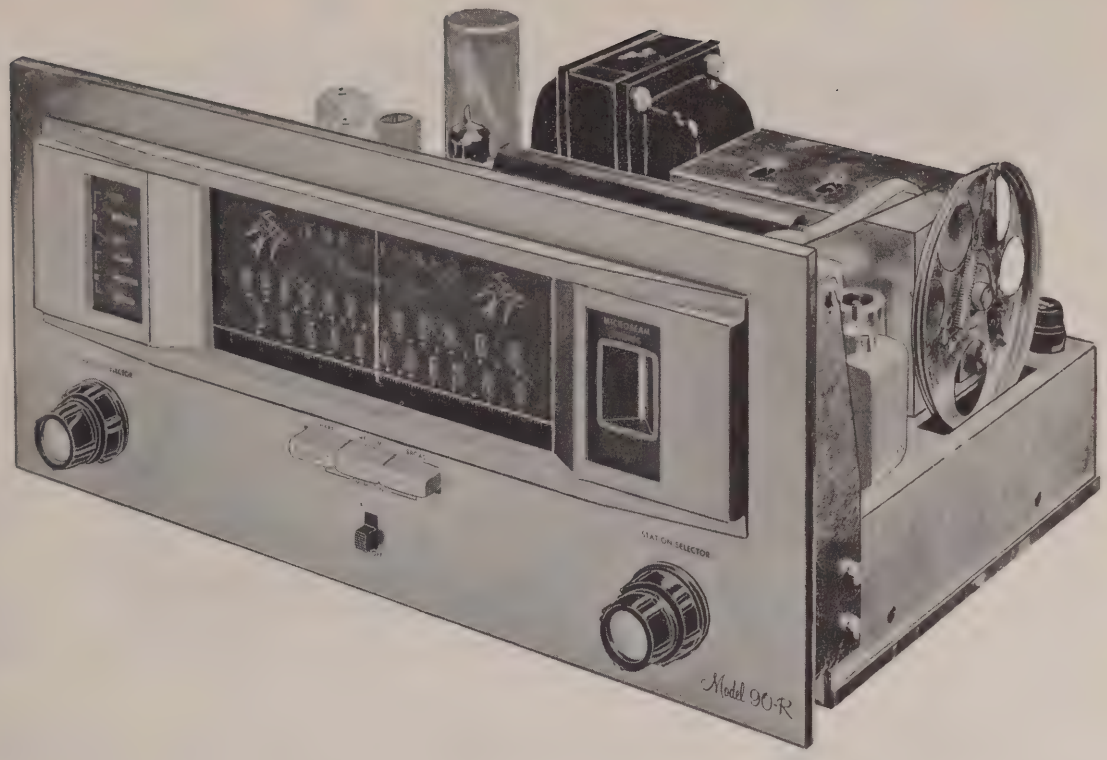
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FANFARE MODEL
322WM

PHOTOFACT* Folder

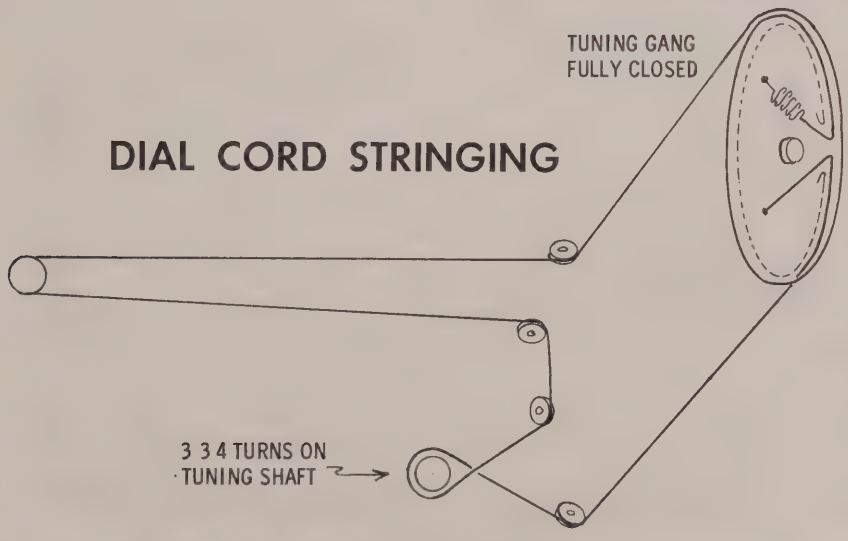
FISHER MODEL
90R



FISHER MODEL
90R

TRADE NAME	Fisher Model 90-R (Serial #19999 And Lower)		
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.		
TYPE SET	AC Operated FM-AM Tuner		
TUBES	Twelve		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.45 Amp. @ 117 Volts AC (45 Watts) FM
TUNING RANGE--BROADCAST	540 - 1700KC	FREQ. MOD.	88-108MC

DIAL CORD STRINGING



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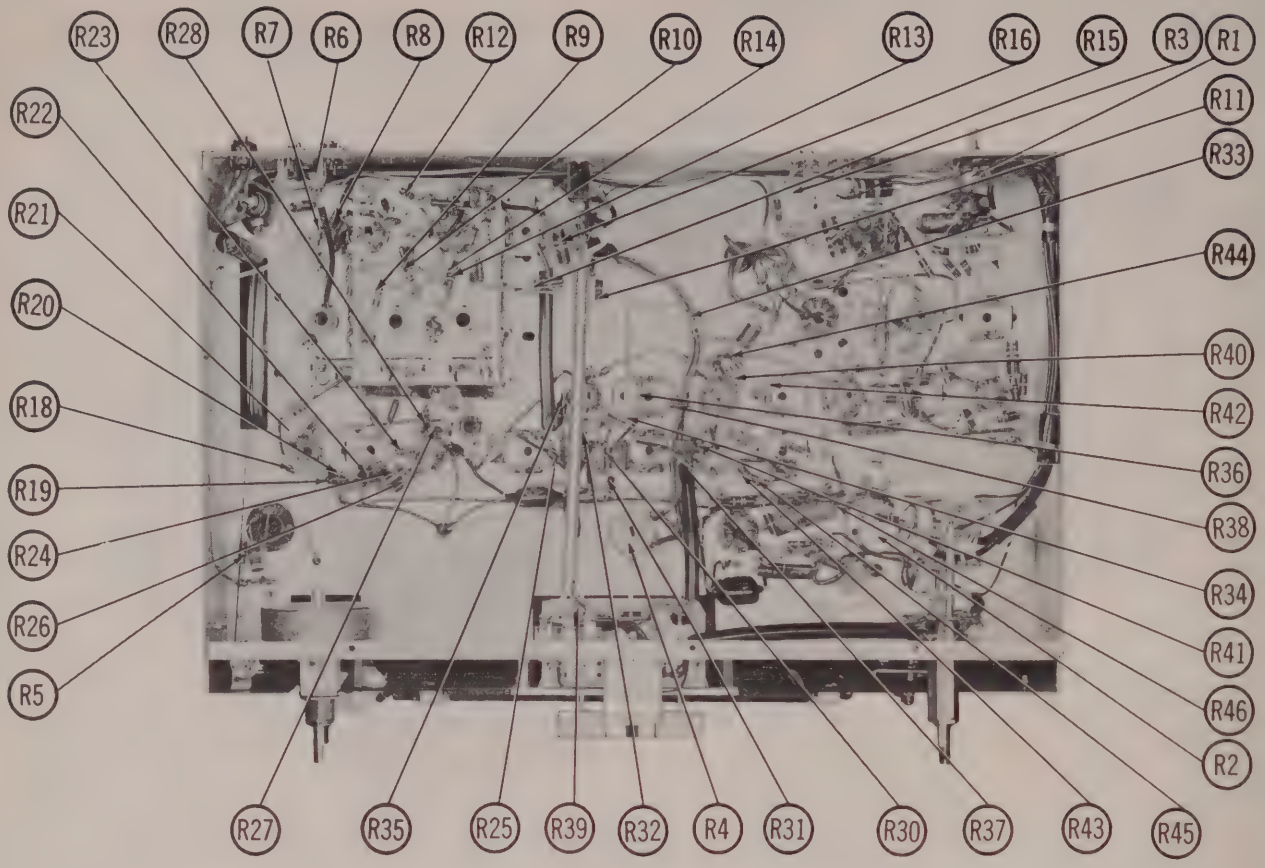
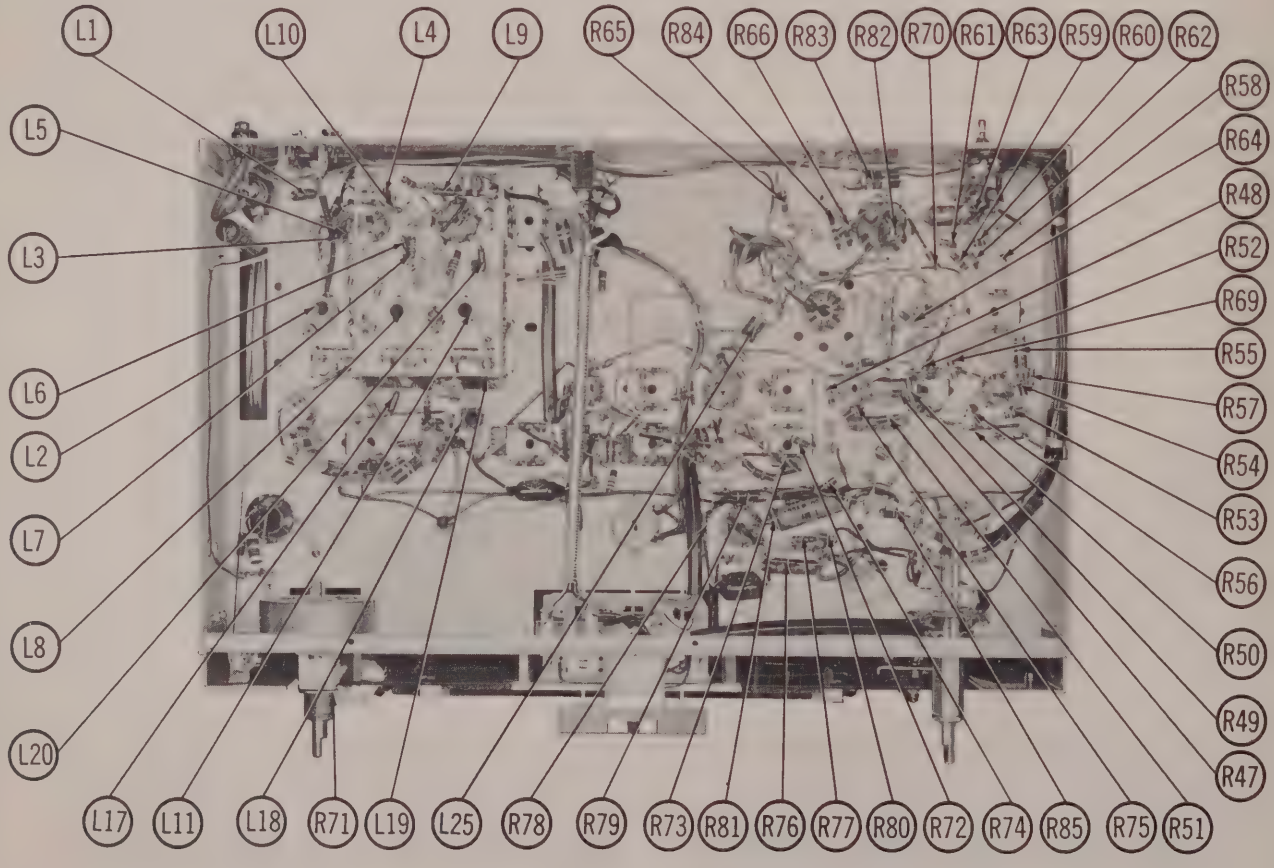
H752

SET 427 FOLDER 8



CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R1-R46)



CHASSIS BOTTOM VIEW INDUCTOR & RESISTOR IDENT. (R47-R85)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp.	V50067/ PCC88
V2	FM Mixer-FM Osc.	6AQ8/ ECC85
V3	AM RF Amp.	6BJ6
V4	AM Conv.	6BE6
V5	1st FM-AM IF Amp.	6BJ6
V6	2nd FM-AM IF Amp. AM Det-AM AVC	EBF89

ITEM No.	USE	TYPE
V7	3rd FM IF Amp.	6BH6
V8	4th FM IF Amp.	6BH6
V9	FM RF AVC Clamper FM-AM AVC Clamper Squelch	6AV6
V10	Tuning Indicator	V50078/ EM840
V11	AF Amp	6267/ EF86
V12	Rect.	6V4/ EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A ▲	40	300	C-629-126	AFH4-04-50	D0034	FP420.38	TMQ-120	Q-012	TVL-4635.3
B ■	40	300							
C ▲	40	250							
D	40	250							
C2	4	50	C-629-175	PWE50005	NL5-50	TT50X5	ML4-50	MQ-1504	TE-1302.1
C3	8	50	C-629-138	PWE50008	NL10-50	TT10X50	ML8-50	MQ-1507	TE-1303.3
C4	1	250	C-546-126	PRS450V1	BR145	TT250X1		MMT-4501	R2702 *
C5	25	6	C-639-114	XPP-6025	NL25-6	TT6X25	ML30-6	MQ-0225	TE-1091

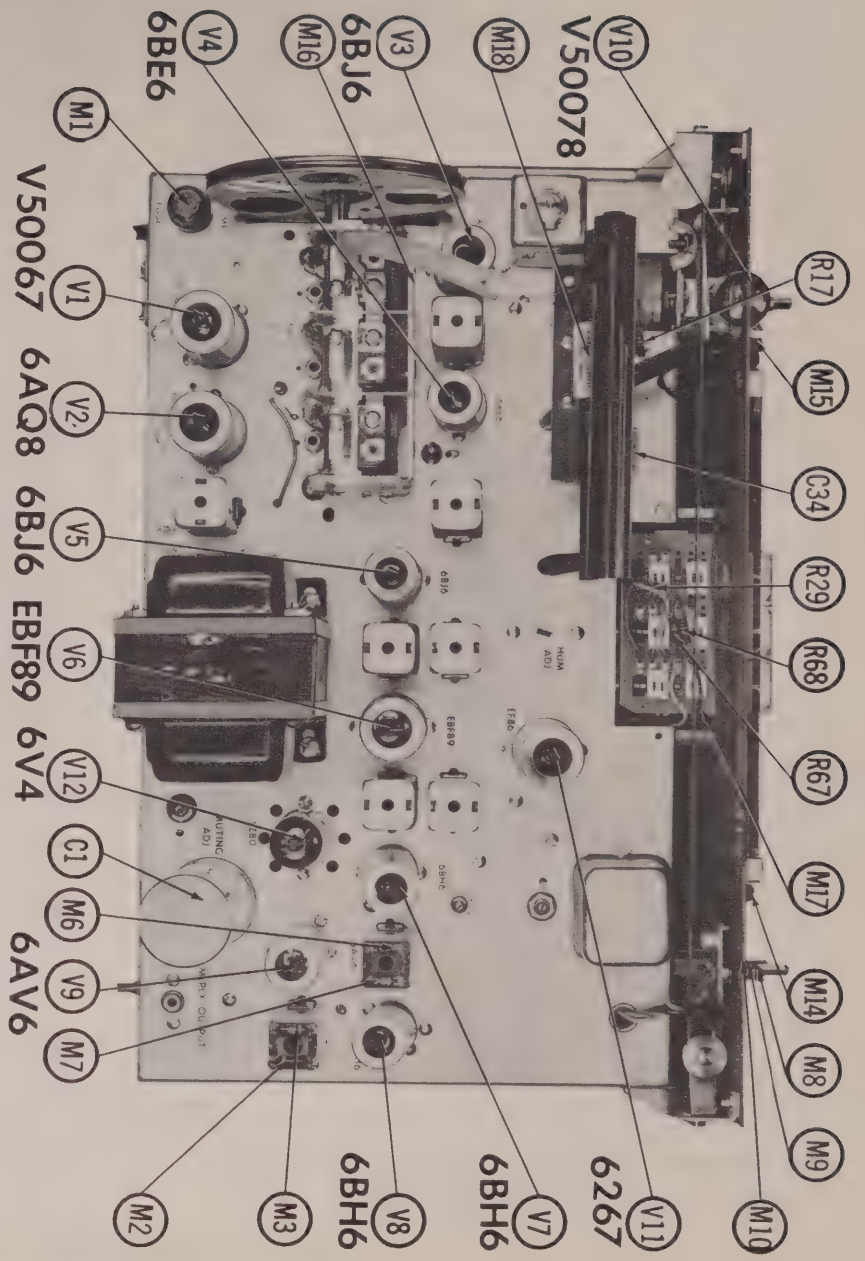
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	24		CC21GP240K5		TCZ-24	CTA6Q24C			10%
C7	5		CC20CH050P5	NPO-SI5			ZT-555		NPO
C8	100	1000	C-50070-5						N1500
C9	100	1000	C-50070-5						N1500
C10	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C11	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C12	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C13	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	①
C14	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C15	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C16	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C17	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C18	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C19	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C20	68		CC21GP680K5	NPO-SI68	D6-680	CTA6Q68C		5TCC-Q68	10%
C21			C-643-153						
C22	5		CC20CH050F5	NPO-SI5			ZT-555		NPO ②
C23	5		CC20CH050F5	NPO-SI5			ZT-555		NPO
C24	24		CC21GP240K5		TCZ-24	CTA6Q24C			10%
C25	100		C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C26	15		CC20TJ150J5						N470 ③
C27			C-643-153						N470
C28	100		C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C29	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C30	1000		CC21GP102K5			1R5D1	MCB255	MS-21	10%
C31	120		CC21GP121K5	NPO-DI120	DD-121	L10T12		MS-312	10%
C32	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	①
C33	1000		C-629-172	EF-001	MFT-1000			503C-D1	
C34			C-629-151-2						
C35	120		CC21GP121K5	NPO-SI120	DD-121	L10T12		MS-312	10%
C36	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C37	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C38	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C39	.68		C-50077-6N		TCZ-R68				
C40	10		CC20CH100G5	NPO-SI10	TCZ-10	CTA6Q1C	ZT-541	5TCC-Q1	NPO
C41	47	1000	C-50070-4						N750 10%
C42	100	1000	C-50070-5						N1500

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C44	470		C-3334	1464-00047		5R5T47		MS-347	5%
C45	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C46	120		CC21GP121K5	NPO-SI120	D6-121	L10T12		5TCC-T12	10%
C47	10		CC20VK100G5						N1400
C48	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C49	470		C-3334	1464-00047		5R5T47		MS-347	5%
C50	.047	250	C-50074-27						10%
C51	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C52	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C53	470		C-3334	1464-00047		5R5T47		MS-347	5%
C54	470		C-3334	1464-00047		5R5T47		MS-347	5%
C55	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C56	10		CC20CH100G5	NPO-SI10	TCZ-10	CTA6Q1C	ZT-541	5TCC-Q1	NPO
C57	1	1000	C-50070-1						P100
C58	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C59	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C60	30	1000	C-50070-3						N150 10%
C61			C-629-151-1						
C62	47		CC21GP470K5	NPO-SI47	D6-470	L10Q47		5TCC-Q47	10%
C63	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C64	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C65	5		CC20CH050F5	NPO-SI5			ZT-555		NPO
C66	5		CC20CH050F5	NPO-SI5			ZT-555		NPO
C67	100	1000	C-50070-5						N1500
C68	100	1000	C-50070-5						N1500
C69	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C70	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C71	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C72	330	1000	C-50072-1	HVD-15-330	DD-331	L10T33	DC3033	5GA-T33	
C73	330	1000	C-50072-1	HVD-15-330	DD-331	L10T33	DC3033	5GA-T33	
C74	330	1000	C-50072-1	HVD-15-330	DD-331	L10T33	DC3033	5GA-T33	
C75	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C76	1000	1000	C-50072-3						10%
C77	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C78	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C79	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C80	5000		C-50071-4	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C81	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C82	1000	1000	C-50071-2	HVD-15-1000	DD-102	L10D1	DC3021	5GA-D1	
C83	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C84	220		CC21GP221K5		DD-221	L10T22		MS-322	10%
C85	20000		C-50071-3	BPD-02	DD-203	BYB6S2		5HK-S2	
C86	.1	250	C-50074-28						10%
C87	50000		C-50071-3	BPD-05	DF-503			5HK-S5	
C88	18		CC20SJ180J5						N330 5%
C89	.01	600	C-2747	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

① Some versions use 5000mmf in this application (Part #C-50071-4)
② Some versions use 3mmf NPO in this application (Part #CC20CH030D5)
③ Some versions use 18mmf N330 in this application (Part #CC20SJ180J5)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	R-520-139	JP-504	A47-500K-S †	Q11-133 †	U50 †	Output Level
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R2A	200K	½	R-629-141-2	JP-254				AM 10KC Filter Adj.
B	Shaft			Not Req.				
R3A	50K	½	R-629-141-1	JP-503	A47-50K-S †	Q11-123 †	U35 †	Muting Adj.
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R4	500Ω	1 (WW)	R-516-128					Hum Adj.

† Enlarge mounting hole to 3/8" diameter.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R5	1000Ω		RC20BF102K	
R6	220Ω		RC20BF221K	
R7	470K		RC20BF474K	
R8	100Ω		RC20BF101K	
R9	330K		RC20BF334K	
R10	330K		RC20BF334K	
R11	1000Ω		RC20BF102K	
R12	820K		RC20BF824K	
R13	4.7Ω		RC20BF4R7K	
R14	1500Ω		RC20BF152K	
R15	6800Ω	1	RC30BF682K	
R16	10K	1	RC30BF103K	
R17	4.7Ω		RC20BF4R7K	
R18	1meg		RC20BF105K	
R19	2.2meg		RC20BF225K	
R20	47K		RC20BF473K	
R21	100Ω		RC20BF101K	
R22	2200Ω		RC20BF222K	
R23	4.7Ω		RC20BF4R7K	
R24	820K		RC20BF824K	
R25	1000Ω		RC20BF102K	
R26	22K	1	RC30BF223K	
R27	22K		RC20BF223K	
R28	100Ω		RC20BF101K	Note 1
R29	100Ω		RC20BF101K	
R30	22meg		RC20BF226K	
R31	330K		RC20BF334K	
R32	68K		RC20BF683K	
R33	100K		RC20BF104K	
R34	82K		RC20BF823K	
R35	100Ω		RC20BF101K	Note 1
R36	82K		RC20BF823K	
R37	1000Ω		RC20BF102K	
R38	10Ω		RC20BF100K	
R39	100Ω		RC20BF101K	
R40	820K		RC20BF824K	
R41	82K		RC20BF823K	
R42	56K		RC20BF563K	Note 2
R43	1000Ω		RC20BF102K	
R44	2.2meg		RC20BF225K	
R45	2.2meg		RC20BF225K	

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R46	100K		RC20BF104K	
R47	56K		RC20BF563K	
R48	100Ω		RC20BF101K	
R49	22K		RC20BF223K	
R50	1000Ω		RC20BF102K	
R51	220K		RC20BF224K	
R52	470K		RC20BF474K	
R53	470K		RC20BF474K	
R54	18K		RC20BF183K	
R55	18K	1	RC30BF183K	
R56	2700Ω		RC20BF272K	
R57	1500Ω		RC20BF152K	
R58	1500Ω		RC20BF152K	
R59	1000Ω		RC20BF102K	
R60	6800Ω		RC20BF682K	Note 3
R61	6800Ω		RC20BF682K	Note 3
R62	270Ω		RC20BF271K	
R63	68K		RC20BF683K	
R64	470K		RC20BF474K	
R65	10K		RC20BF103K	
R66	220K		RC20BF224K	
R67	12K		RC20BF123K	
R68	18K		RC20BF183K	
R69	100K		RC20BF104K	
R70	10meg		RC20BF106K	
R71	470K		RC20BF471K	
R72	3.3meg		RC20BF335K	
R73	56K		RC20BF563K	
R74	22K		RC20BF223K	
R75	22meg		RC20BF226K	
R76	1meg		RC20BF105K	
R77	560Ω		RC20BF561K	
R78	150K		RC20BF154K	
R79	47K		RC20BF473K	
R80	330K		RC20BF334K	
R81	2.2meg		RC20BF225K	
R82	10K		RC20BF103K	
R83	390Ω	2	RC40BF391K	
R84	270Ω	2	RC40BF271K	
R85	100K		RC20BF104K	

Note 1. Not used in some versions.
Note 2. Some versions use 82K in this application. (Part #RC20BF823K). Not used in other versions.
Note 3. Some versions may use 68K in this application. (Part #RC20BF683K)

COILS (RF-IF)

ITEM No.	USE	FISHER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Choke	L-50066-8					3.3 Microhenries
L2	FM Ant. Coil	L-629-177					
L3	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L4	Fil. Choke	L-50066-19					.56 Microhenries
L5	RF Choke	L-50066-19					.56 Microhenries
L6	RF Choke	L-50066-19					.56 Microhenries
L7	RF Choke	L-629-180					Wound On 100Ω Resistor
L8	FM RF Coil	L-629-178					
L9	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L10	Fil. Choke	L-50066-19					.56 Microhenries
L11	FM Osc. Coil	L-6-629-179					
L12	Loopstick	L-629-176					
L13	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L14	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA					
		FISHER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L15	AM Ant. Trans.	L-629-171					
L16	AM RF Coil	L-556-125					
L17	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L18	AM Osc. Coil	C-550-122					
L19	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L20	RF Choke	L-50066-3	19-1000	BC-561	4602		1.2 Microhenries
L21	1st FM IF	ZZ-630-114	16-3487				
L22	1st AM IF	ZZ-629-135					
L23	2nd FM IF	ZZ-629-142	16-3487	FM-254	1463		
L24	2nd AM IF	ZZ-629-135					
L25	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.2 Microhenries
L26	3rd FM IF	ZZ-629-142	16-3487	FM-254	1463		
L27	3rd AM IF	ZZ-2984	16-6758	BC-353	12-C2	RF-2	
L28	FM Limiter	L-551-121					
L29	Ratio Detector	ZZ-592-170					
L30	10KC Filter Choke	L-629-152					

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M8	Lamp	1-588-120	6.3 Volts, .150 Amp.
M9	Lamp	1-588-120	6.3 Volts, .150 Amp.
M10	Lamp	1-588-120	6.3 Volts, .150 Amp.
M11	Lamp	1-588-120	6.3 Volts, .150 Amp.
M12	Lamp	1-588-120	6.3 Volts, .150 Amp.
M13	Lamp	1-588-120	6.3 Volts, .150 Amp.
M14	Lamp	1-563-145	6 Volts, 2 Watts
M15	Lamp	1-563-145	6 Volts, 2 Watts
M16	Tuning Cap.	C-628-118	AM-FM, 6 Gang, Ant. 19-493mmf, RF 20-489mmf, Osc. 18-165mmf } AM
M17	Switch	S-628-117	Muting, Bandwidth (Pushbutton Type)
M18	Switch	S-629-156	AM Antenna (SPDT, Slide Type)
M19	Switch	S-628-122	On-Off (SPST, Slide Type)
M20	Switch	S-628-124	Channel Selector (Rotary, Wafer Type) Chassis with Serial Numbers Ending in "B"
	Switch	S-628-123	Channel Selector (Rotary, Wafer Type) Chassis with Serial Numbers Ending in "A"

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .45A	400VCT @ .050A	7V Tap @ 6.3V @ 3.6A	T-628-121						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ .2A									

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	E-50049-3	For Chassis Serial Numbers Ending in "B"
Knob	E-50049-1	Tuning for Chassis Serial Numbers Ending in "A"
Knob	E-50049-12	Selector for Chassis Serial Numbers Ending in "A"
Panel	AS-628-129	Dress, Assembled, Includes Escutcheon
Panel	AS-628-112	Dress, Without Escutcheon
Pointer	A-629-154	Dial
Dial Glass	N-629-133	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FISHER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A 250V	F-3329		312001. (3AG 1A 250V)	342001	AGC 1	HKP

WIRING DATA

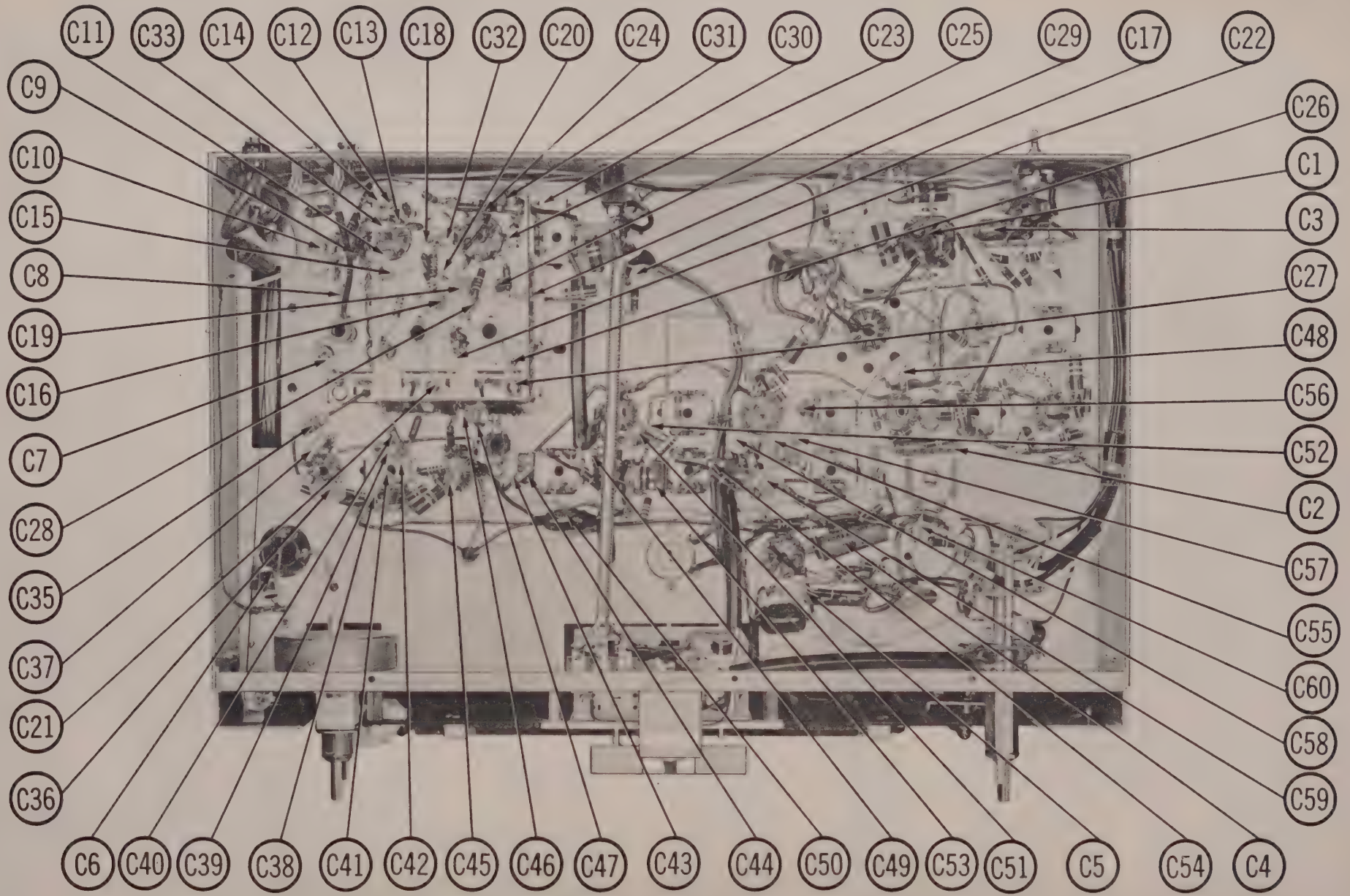
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

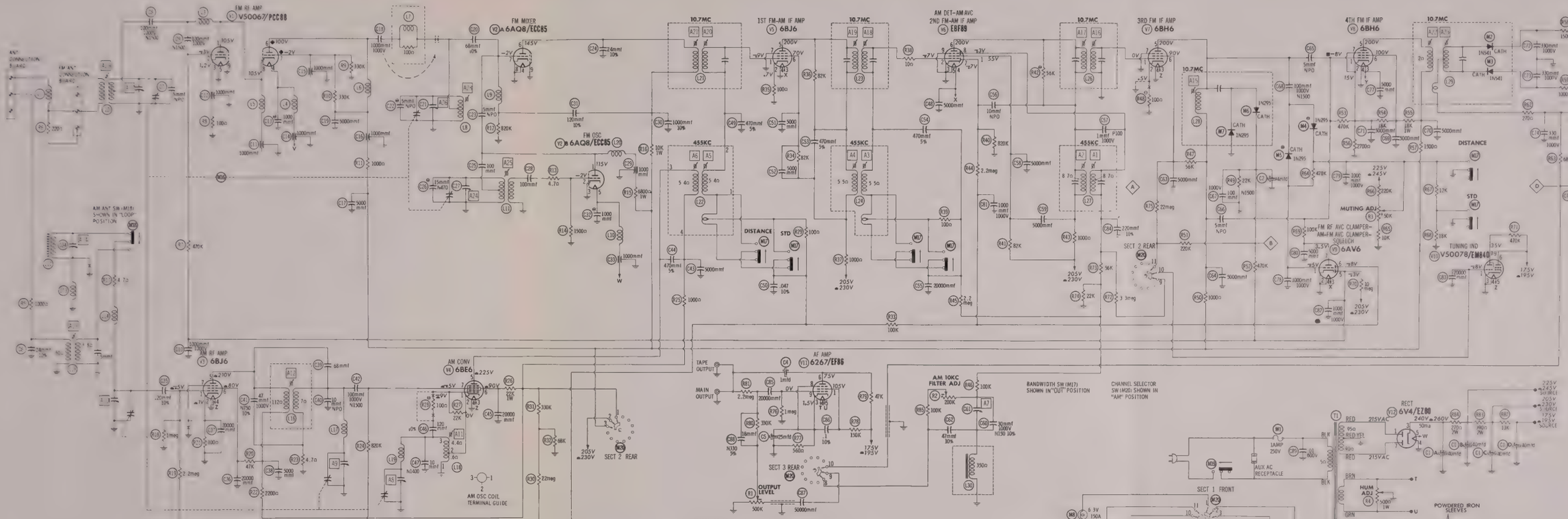
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FISHER PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N541	V-1N542	1N636	1N295	FM Detector (Pigtail) } Matched Pair
M3	1N541	V-1N542	1N636	1N295	FM Detector (Pigtail } Matched Pair
M4	1N295 †	V-1N541 *	1N60	1N295	FM Muting (Pigtail)
M5	1N295 †	V-1N541 *	1N60	1N295	FM Muting (Pigtail)
M6	1N295	V-1N295	1N60	1N295	FM Limiter (Pigtail)
M7	1N295	V-1N295	1N60	1N295	FM Limiter (Pigtail)

† Some versions may use 1N66 in this application.
* Alternate Part #V-1N66.



CHASSIS BOTTOM VIEW - CAPACITOR IDENT. (C1-C60)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	V50067 PCC88	INF	1meg	100Ω	.1Ω	0Ω	↑1600Ω	160K	INF	0Ω
V2	6AQ8 ECC85	↑7400Ω	1500Ω	0Ω	0Ω	.1Ω	↑10K	820K	0Ω	0Ω
V3	6BJ6	∠850K	100Ω	0Ω	.1Ω	↑∠2800Ω	↑∠50K	0Ω		
V4	6BE6	∠22K	∠.6Ω	.1Ω	0Ω	↑∠1600Ω	↑∠22K	2.2meg		
V5	6BJ6	1.5meg	100Ω	.1Ω	0Ω	↑1600Ω	↑82K	0Ω		
V6	EBF89	↑82K	2.2meg	0Ω	.1Ω	0Ω	↑1600Ω	630K	78K	0Ω
V7	6BH6	.6Ω	100Ω	.1Ω	0Ω	↑1600Ω	↑65K	0Ω		
V8	6BH6	470K	2700Ω	.1Ω	0Ω	↑2100Ω	↑17K	2700Ω		
V9	6AV6	470K	0Ω	.1Ω	0Ω	490K	1.4meg	550K		
V10	V50078 EM840	230K	TP	0Ω	0Ω	.1Ω	↑10K	↑480K	TP	↑480K
V11	6267 EF86	↑160K	0Ω	560Ω	120Ω	120Ω	↑57K	0Ω	560Ω	1meg
V12	6V4 EZ80	95Ω	NC	¶	0Ω	.1Ω	NC	90Ω	NC	NC

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
↑ MEASURED FROM PIN 3 OF V12
∠ MEASURED IN "AM" POSITION
* MEASURED FROM PIN 8 OF V1
■ MEASURED FROM PIN 2 OF V8
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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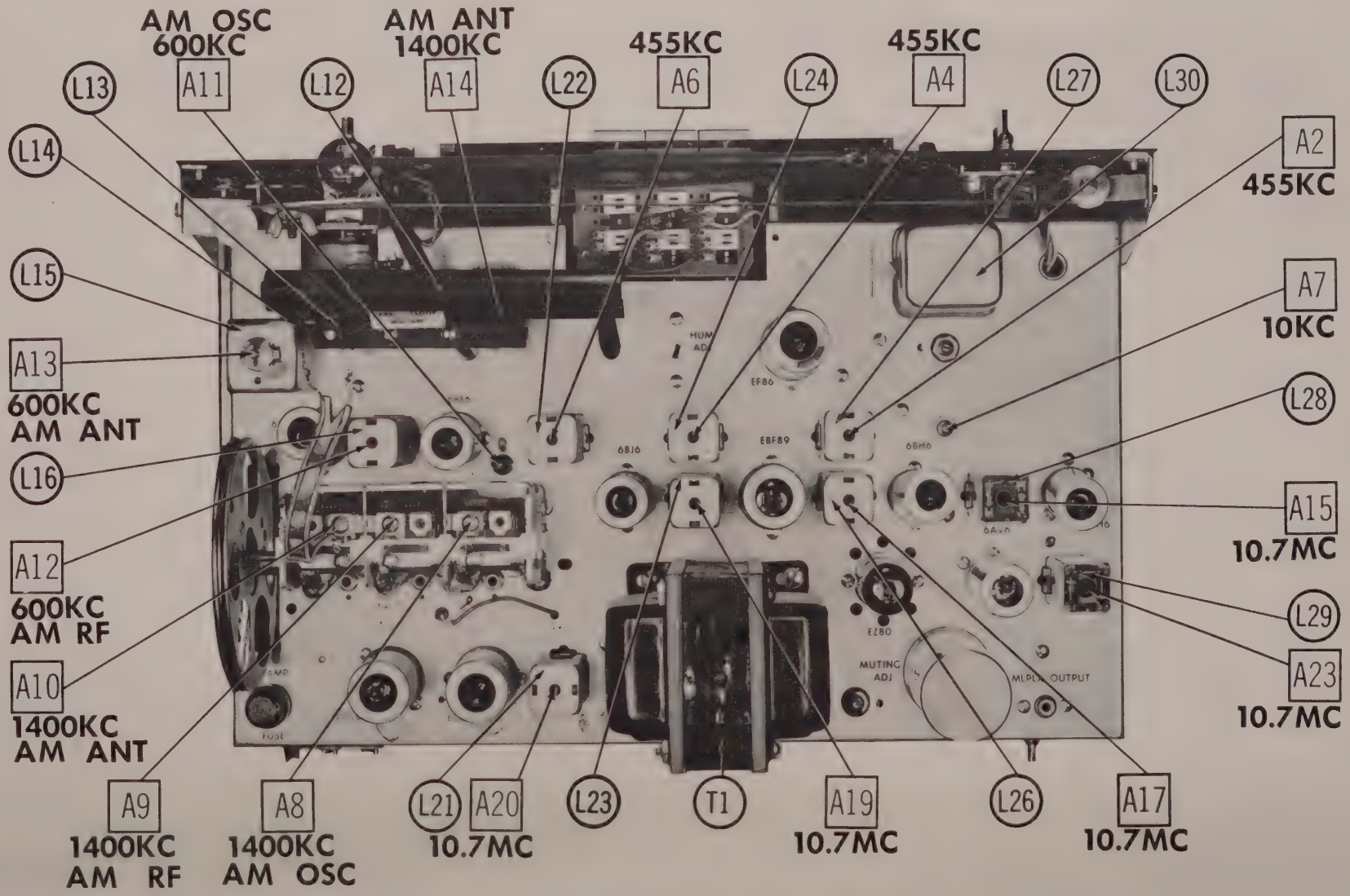
FISHER MODEL 90R



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Remove external antenna & antenna link between Terminals 1 & 2.
Adjust pointer to coincide with zero index mark on logging scale with tunning gang fully closed.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mf	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis	455KC (400∿ Mod.)	AM Sharp Distant	Tuning gang fully open	DC Probe to point Ⓐ Common to chassis	A1, A2 A3, A4 A5, A6	Adjust for maximum deflection.
2.		High side to junction of R73, & R74. Low side to chassis	10KC	"	"	AC probe to main audio output jacks common to chassis	R2, A7	Adjust for MINIMUM deflection.
3.	220mmf	High side to AM antenna terminal. Low side to chassis	1400KC	"	1400KC	DC probe to point Ⓐ Common to chassis	A8, A9, A10	Adjust for maximum deflection.
4.	"	"	600KC	"	600KC	"	A11, A12 A13	Adjust for maximum deflection. Repeat Steps 3 & 4.
5.		Loop	1400KC	"	1400KC	"	A14	"
6.	.01mf	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis	455KC (30KC SWP)	AM Broad Local Ext.	Tuning gang fully open	(Use Scope) Vert. amp to main audio output jack. Low side to Chassis	A2	Adjust SLIGHTLY for symmetrical curve

FM IF ALIGNMENT, USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.		High side to ungrounded tube shield of 6AQ8/ ECC85 (V2). Low side to chassis.	10.7MC (Unmod)	FM Off Distant	Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A15, A16, A17, A18, A19, A20, A21	Adjust for maximum deflection.
8.		"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A22	"
9.		"	"	"	"	DC probe to point Ⓓ. Common to pcint Ⓒ.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

10.7MC

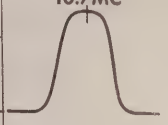


FIG. 1

FM IF ALIGNMENT, USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

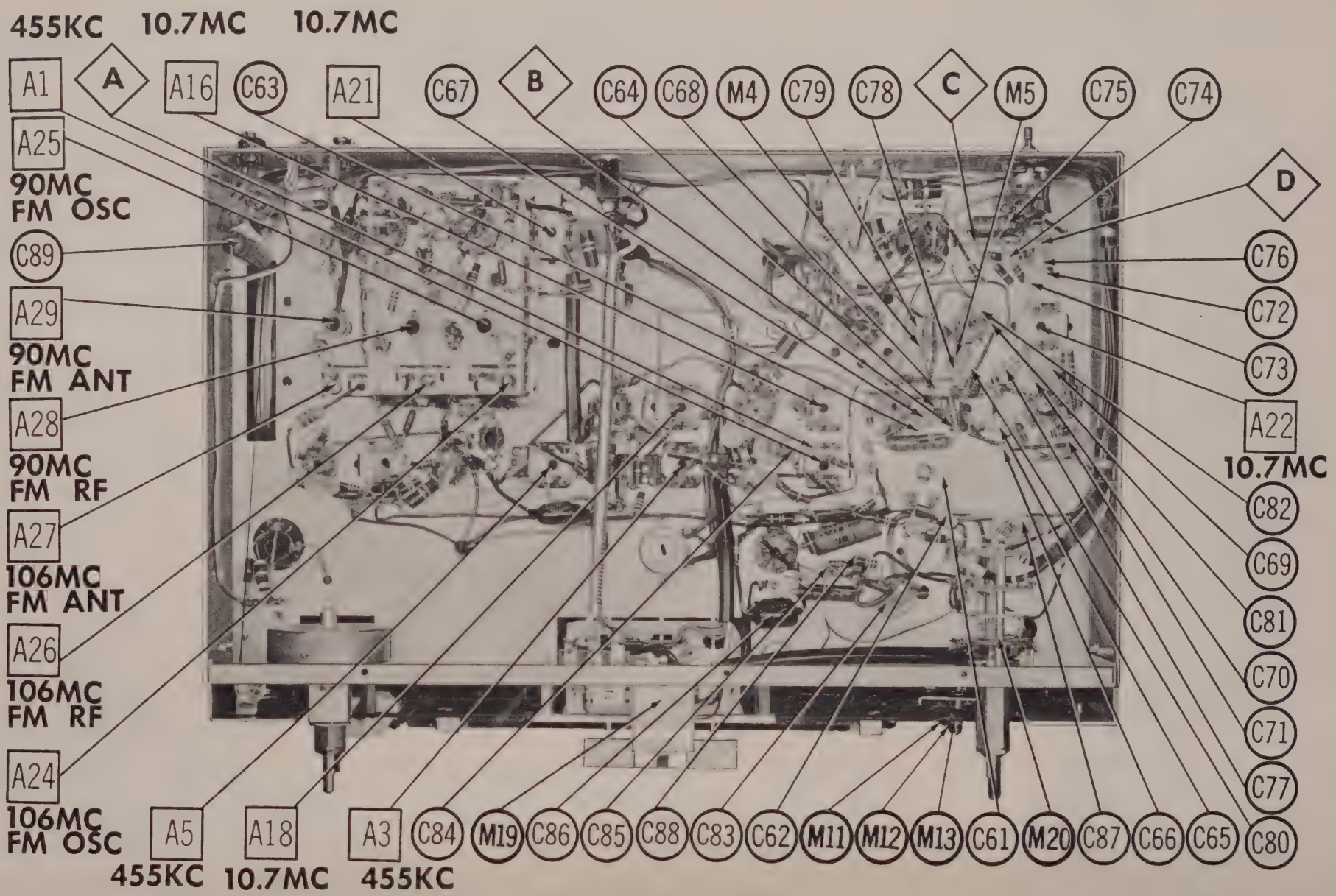
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.		High side to ungrounded tube shield of 6AQ8/ ECC85 (V2). Low side to chassis	10.7MC (450KC SWP)	FM Off Distant	Point of non-interference	Vert. Amp to point Ⓑ. Low side to chassis.	A15, A16, A17, A18, A19, A20, A21	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symetry similar to Fig. 1.
8.		"	"	"	"	Vert. amp to point Ⓒ. Low side to chassis.	A22	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
9.		"	"	"	"	Vert. amp to point Ⓓ. Low side to chassis.	A23	Reconnect syabilizing capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A22 for maximum amplitude and straightness of crossover lines.

10.7MC

FIG. 2

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each side.	106MC (Unmod.)	FM Off Distant	106MC	DC probe to point Ⓑ. Common to chassis. Vert. amp of scope to main audio output jack. Low side to chassis	A24	Adjust for maximum deflection and for sine wave output.
11.	"	"	90MC	"	90MC	"	A25	"
12.	"	"	106MC	"	106MC	"	A26, A27	"
13.	"	"	90MC	"	90MC	"	A28, A29	Adjust for maximum deifection and for sine wave output. Repeat Steps 4 thru 7.
14.	"	"	98MC @ 100micro-volts	"	Tune for 90MC signal	(Use Scope) Vert. amp to main audio output jack. Low side to chassis.		Check for no overload and clipping of wave form.
15.	"	"	"	"	"	VTVM AC probe to main audio output jack. Common to chassis.	R3	Observe deflection with "Distant" pushbutton depressed. Depress "Local" pushbutton and adjust R3 for reading of 2DB below reading with "Distant" pushbutton depressed.



CHASSIS BOTTOM VIEW - ALIGN., MISC. & CAPACITOR IDENT. (C61-C89)

PHOTOFACT* Folder

with CIRCUITRACE*

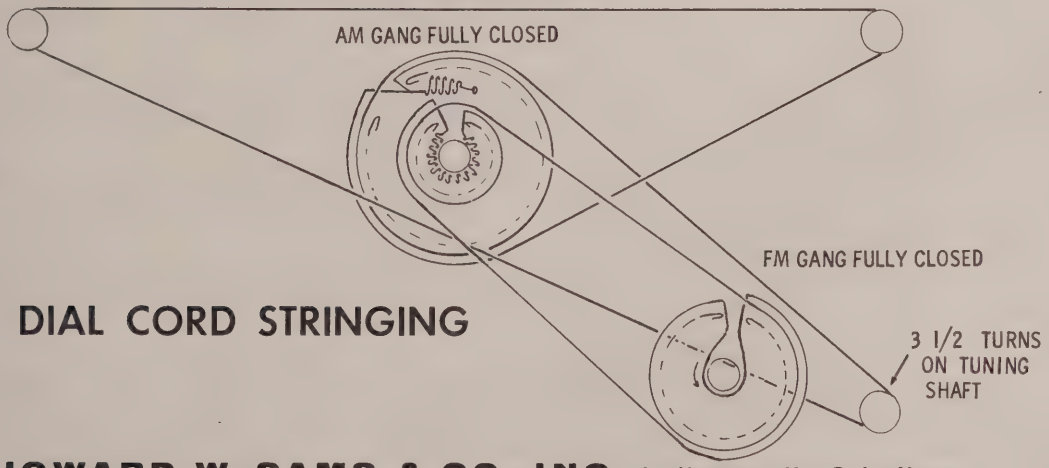
PHILCO MODELS F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1 (Ch. RT-100, RT-200, RT-201)

MODEL F-1803

TRADE NAME	Philco Models F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	All Models Employ a 4 Speed Automatic Record Changer Except HFT-1 Models F-1600, F-1700: Phono Amplifier Model F-1702: AM Tuner (RT-100) and Amplifier Model F-1802: FM-AM Tuner (RT-200) and Amplifier Models F-1803, F-1805: FM-AM Tuner (RT-201) and Amplifier Model HFT-1: FM-AM Tuner With Cathode Follower
TUBES	AM Tuner: 3 FM-AM Tuner: 8 (9 used in Model HFT-1) Amplifier: 4
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING FM: .94 Amp. @ 117 Volts AC (95 Watts) Phono: .61 Amp. @ 117 Volts AC (60 Watts) Less Motor
TUNING RANGE	BROADCAST 540-1620KC FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - PHILCO M-39 - SEE PHOTOFACT SET 362 FOLDER 6 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H751

PHILCO MODELS F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1 (Ch. RT-100, RT-200, RT-201)

SET 427 FOLDER 9

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.	6BZ6	
V2	FM Converter-AFC	12AT7	
V3	FM IF Amp.	6BA6	
V4	AM RF Amp.	6BA6	
V5	AM Converter	6BE6	
V6	FM AM IF Amp.	6BA6	
V7	Limiter	6BY8	
V8	Disriminator-AM Det.-AVC	6BJ7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	30-2585-9	AFH2-19-05	BBRD8515	TCD498	TDLD-12	MTD-303	PCL-2442
B	▲50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100		30-1257-12	1469-0001		22R5T1	MCE235	MS-T1	5%
C3	2-5								
C4	100			1468-0001	D6-101	5W5T1	MC235	1FM-T1	
C5	1000		62-210001011	SI 1000	D6-102	LT6D1	UC-521	5GA-D1	
C6	150		30-1257-13	1468-00015	D6-151	22R5T15	MC236	1FM-315	
C7	1000		62-210001011	SI 1000	D6-102	LT6D1	UC-521	5GA-D1	
C8	100		30-1257-12	SI 100	D6-101	LT6T1	UC-531	5GA-T1	①
C9	680		30-1257-15	1464-00068	D6-681	1R5T68		MS-368	10%
C10	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C11	10		62-01040911	SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C12	10		62-01040911	SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C13	180		30-1257-8	1469-00018	D6-181	22R5T18		MS-318	10%
C14	.5-3		31-6520-18		829-3		CT565A		
C15	1.5		30-1224-133	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C16	12		62-012300001	SI 12	D6-120	LT6Q12	UC-5412	5GA-Q12	
C17	5000		30-1238-20	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C18	150			1468-00015	D6-151	5W5T15	MC236	1FM-315	
C19	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C20	12		62-012300001	SI 12	D6-120	LT6Q12	UC-5412	5GA-Q12	
C21	1000		62-210001011	SI 1000	D6-102	LT6D1	UC-521	5GA-D1	
C22	100		62-110009011	SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C23	1000		62-210001011	SI 1000	D6-102	LT6D1	UC-521	5GA-D1	
C24	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C25	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C26	10000		30-1262-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C27	47		30-1230-4	SI 47	D6-470	LT6Q47	UC-5447	5GA-Q47	
C28	7.5		30-1224-83						
C29	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C30	.047	200	30-4684-28	P288N-047		BC2S47J	ACE6147	2SE-S47	
C31	1000		30-1262-12	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C32	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C33	10000		30-1238-2	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C34	4700		30-1262-3	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C35	22		30-1263-19	DI-000022	DD-220	L10Q22	UC-5422	5GA-Q22	
C36	4700		30-1262-3	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C37	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C38	.47	200	30-4685-34	P288N-47		BC2P47J		2SE-P47	
C39	680		62-168001011	SI 680	D6-681	LT6T68	UC-5368	5GA-T68	
C40	220		30-1262-23	DI-00022	DD-221	L10T22	UC-5322	5GA-T22	
C41	220		30-1262-23	DI-00022	DD-221	L10T22	UC-5322	5GA-T22	
C42	33		30-1263-8	DI-000033	DD-330	L10Q33	UC-5433	5GA-Q33	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	150		30-1262-24	DI-00015	DD-151	L10T15	UC-5315	5GA-T15	
C44	1000		30-1262-12	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C45	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C46	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C47	10000		30-1262	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C48A	4000	125VAC	30-1266-1	DAC-7					
B	4000	125VAC							
C49	680			SI 680	D6-681	LT6T68	UC-5368	5GA-T68	②

① Some versions may use 68mmf in this application.
② Model F-1802 uses 2200mmf and F-1902 uses .22mfd in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PHILCO PART No.	NOTES
R1	1meg		66-5108340	
R2	220K		66-4228340	
R3	100Ω		66-1108340	
R4	6800Ω		66-2688340	
R5	1500Ω		66-2158340	
R6	1meg		66-5108340	
R7	6800Ω		66-2688340	
R8	47Ω		66-0478340	
R9	100K		66-4108340	
R10	1800Ω		66-2188340	
R11	1meg		66-5108340	
R12	22K		66-3228340	
R13	2.2meg		66-5228340	
R14	470K		66-4478340	
R15	220Ω		66-1228340	
R16	68Ω		66-0688340	
R17	220Ω		66-1228340	
R18	100K		66-4108340	
R19	1meg		66-5108340	
R20	1meg		66-5108340	
R21	15K		66-3158340	
R22	38K		66-3688340	
R23	47K		66-3478340	
R24	22K		66-3228340	
R25	22K		66-3228340	
R26	100K		66-4108340	
R27	2200Ω		66-2228340	
R28	2.2meg		66-5228340	
R29	680Ω	1	66-1685340	
R30	22Ω	(WW)	33-1334-21	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	32-4751-1					
L2	FM RF Coil	32-4717-2					
L3	FM Osc. Coil	32-4716-1					
L4	RF Choke	32-4735-1	19-1003	BC-564	4608		4.1 Millihenries
L5	Loop Ant.						
L6	AM RF Coil	32-4399-8					
L7	AM Osc. Coil	32-4693-9					
L8	1st FM IF	32-4715-1	16-3487	FM-254	1463		
L9	1st AM IF	32-4583-17	16-6780	BC-357	13-PC2	RF-4	
L10	2nd FM IF	32-4712-1	16-3490		1463-PC		
L11	2nd AM IF	32-4583-17	16-6780	BC-357	13-PC2	RF-4	
L12	3rd FM IF	32-4712-2	16-3490		1463-PC		
L13	Discriminator	32-4752-1	17-3492		1465		Tertiary Winding 1.5Ω
L14	Fil. Choke	32-4422-8	19-1002	BC-563	4606		2.2 Millihenries, IRC Part CLA

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .40A	120V @ .052A tap @ 6.3V @ 3A		32-8808-1						

TUNER PARTS LIST AND DESCRIPTIONS (cont)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.052A	34-8040-4	1004A	RS100	100	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	Lamp	34-2031-13	#1847
M3	Lamp	34-2031-13	#1847
M4	Tuning Cap.	31-2789-1	FM, 3 Gang
M5	Tuning Cap.	31-2787-5	AM, 3 Gang
M6	Switch	42-2069-1	Function, Rotary, Wafer Type
	Printed Board	54-9961-2	

CABINETS & CABINET PARTS

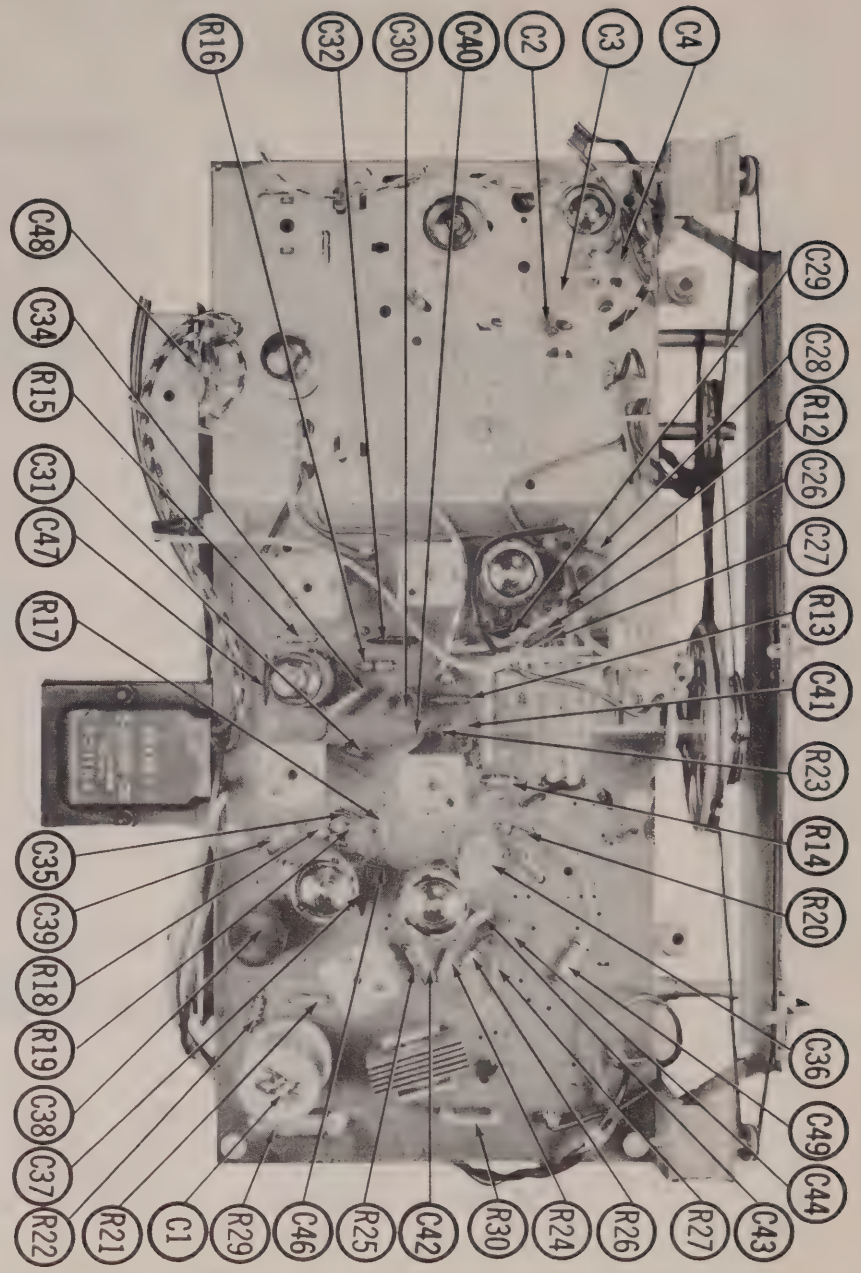
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

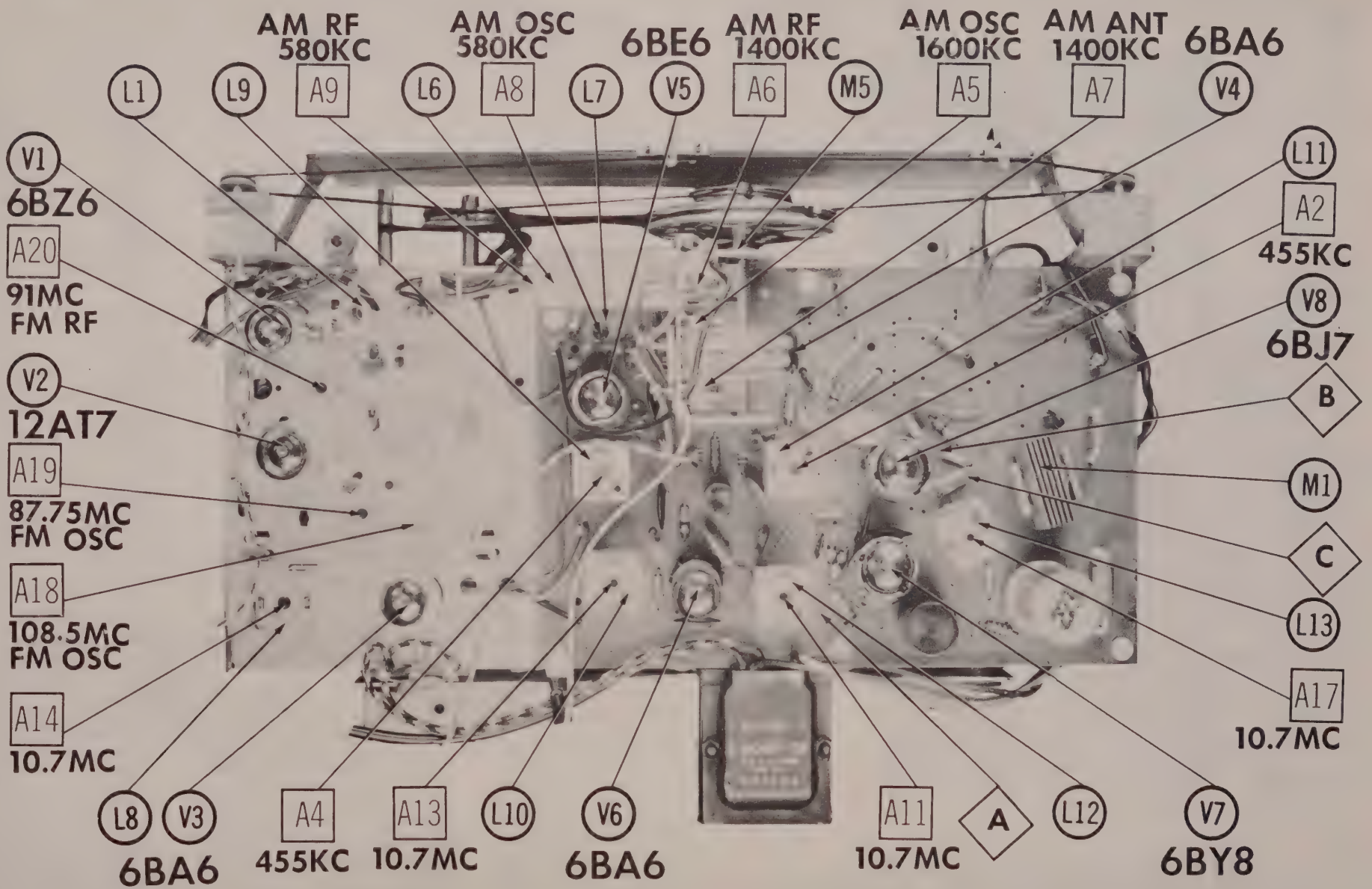
NAME	PART NO.	DESCRIPTION
Bezel	28-12232-1	Instrument Panel, Models F-1803, F-1805
Bezel	28-12234-1	Tuner, Model F-1805
Knob	54-6035-4	Tuning, Models F-1802, F-1803, F-1805
Knob	54-6035-9	Tuning, Model F-1702
Knob	54-6035-11	Selector, Model F-1802
Knob	54-6035-12	Selector, Models F-1803, F-1805
Knob	54-6271-1	Amplifier (4 Used), Models F-1803, F-1805
Knob	54-6147-25	Amplifier (4 Used), Model F-1802
Knob	54-6093-18	Amplifier (4 Used), Models F-1702, F-1700
Knob	54-6093-17	Amplifier (4 Used), Model F-1600
Knob	54-6396-1	Pointer, Model F-1702
Pointer	28-9739-8	(2 Used), Model F-1805
Dial Scale	54-5346	Models F-1803, F-1850
Leg	424-0022-19	Mahogany, Model F-1700, F-1702
Leg	424-0022-20	Blond, Models F-1700, F-1702
Leg	424-0022-13	Mahogany, Model F-1600
Leg	424-0022-14	Blond, Model F-1600
Cabinet	11309-2	Mahogany, Model F-1803
Cabinet	11309-3	Cherry, Model F-1803
Cabinet	11292-1	Mahogany, Model F-1802
Cabinet	11292-3	Blond, Model F-1802
Cabinet	11292-5	Fruitwood, Model F-1802
Cabinet	11313-3	Walnut, Model F-1805
Cabinet	11313-1	Walnut light, Model F-1805
Cabinet	11290-1	Mahogany, Model F-1702
Cabinet	11290-3	Blond, Model F-1702
Cabinet	11290	Mahogany, Model F-1700
Cabinet	11290-2	Blond, Model F-1700
Cabinet	11287	Mahogany, Model F-1600
Cabinet	11287-1	Blond, Model F-1600
Cabinet	11243	Mahogany, Model HFT-1
Cabinet	11243-1	Fruitwood, Model HFT-1
Cabinet	11243-2	Blond, Model HFT-1

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUNER CHASSIS—TOP VIEW





FM-AM TUNER CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Adjust AM pointer to first small index mark before the "5" (540KC) mark on scale with tuning gang fully closed.
Adjust FM pointer to first small index mark before the "88" mark on scale with tuning gang fully closed.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open	Vert. Amp. to audio output jack. Low side to chassis.	A1, A2, A3, A4	Adjust for maximum amplitude.
2.	Direct	Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	1400KC	"	Tune to 1400KC signal	"	A6, A7	"
4.	"	"	580KC	"	580KC	"	A8, A9	Adjust A8 for maximum by rocking tuning gang thru 580KC signal. Adjust A9 for maximum. Repeat steps 2, 3, &4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	200mmf	High side to pin 1 (grid) of 6BZ6 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe thru 100K to point (A). Common to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum deflection.
6.	"	High side to pin 1 (grid) of 6BY8 (V7). Low side to chassis.	10.7MC (400∿ Mod)	"	"	DC probe thru 100K to point (B). Common to chassis.	A16	Adjust for maximum deflection.
7.	"	"	10.7MC (Unmod)	"	"	DC probe thru 100K to point (C). Common to point B	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 300KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

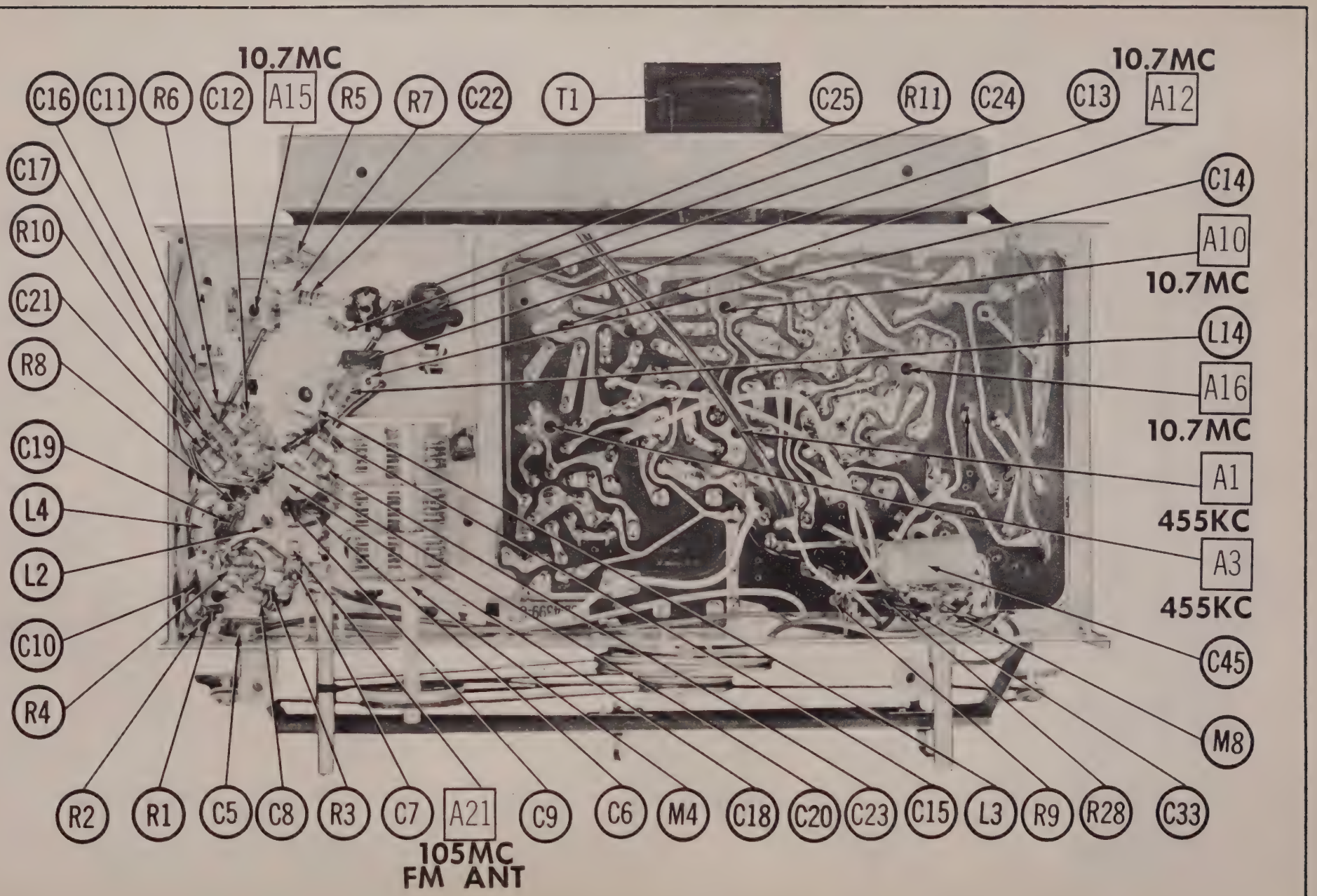
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	200mmf	High side to pin 1 (grid) of 6BZ6 (V1). Low side to chassis.	10.7MC (300KC Swp)	FM	Point of non-interference	Vert. Amp. thru 100K to point (A). Low side to chassis.	A10, A11, A12, A13, A14, A15	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	High side to pin 1 (grid) of 6BY8 (V7). Low side to chassis.	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A16	Adjust for curve of maximum amplitude.
7.	"	"	"	"	"	"	A17	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT

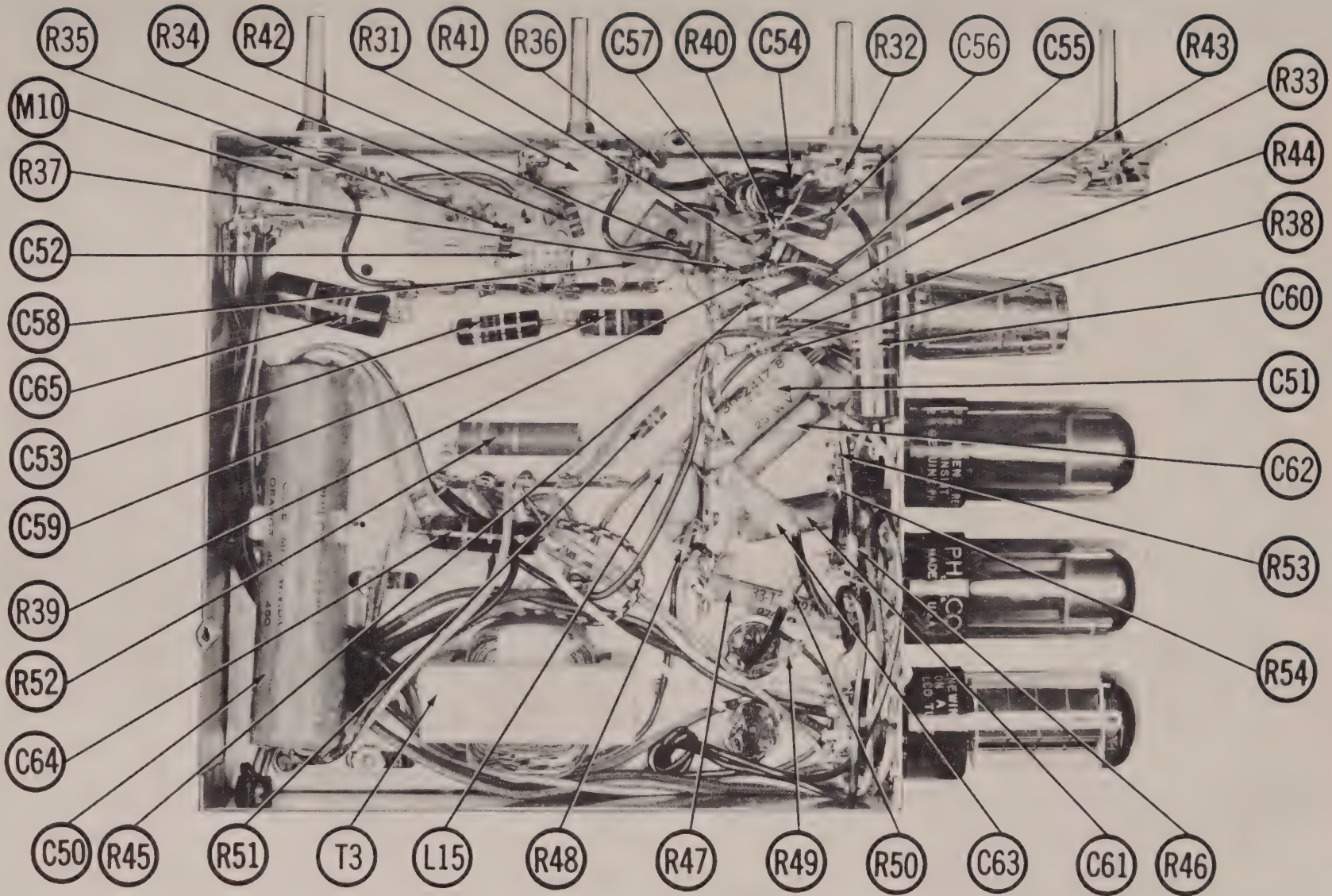
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistor	Across FM antenna terminals	108.5MC	FM	Open tuning gang. Insert a .006" non-metallic shim between rotor & stator. Close gang against shim.	DC probe thru 100K to point (B). Common to chassis.	A18	Adjust for maximum deflection.
9.	"	"	87.75MC	"	Tuning gang fully closed	"	A19	"
10.	"	"	91.0MC	"	91.0MC	"	A20	"
11.	"	"	105.0MC	"	Tune to 105MC signal	"	A21	"

FIG. 1

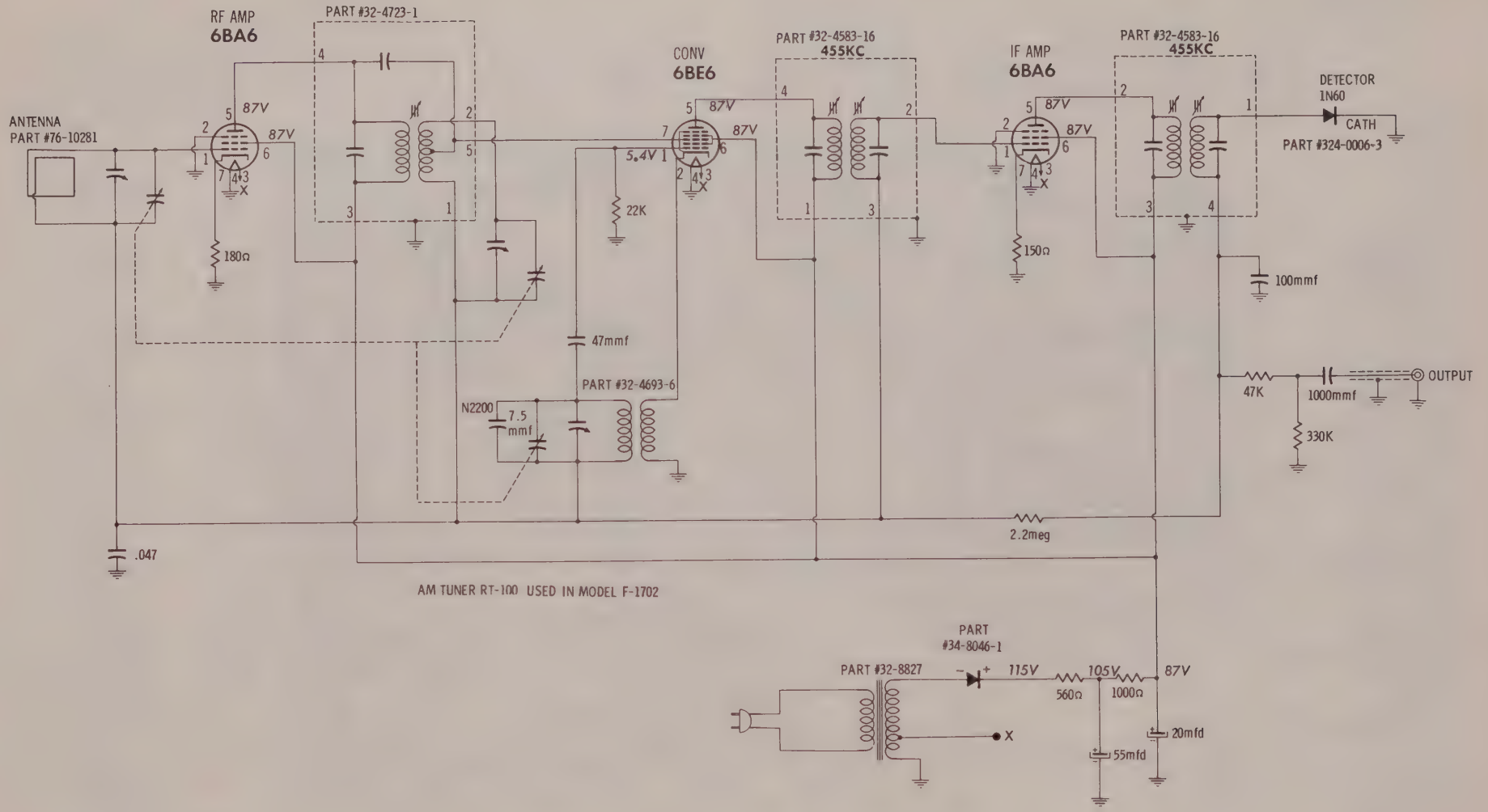
FIG. 2



FM-AM TUNER CHASSIS - BOTTOM VIEW



AMP CHASSIS - BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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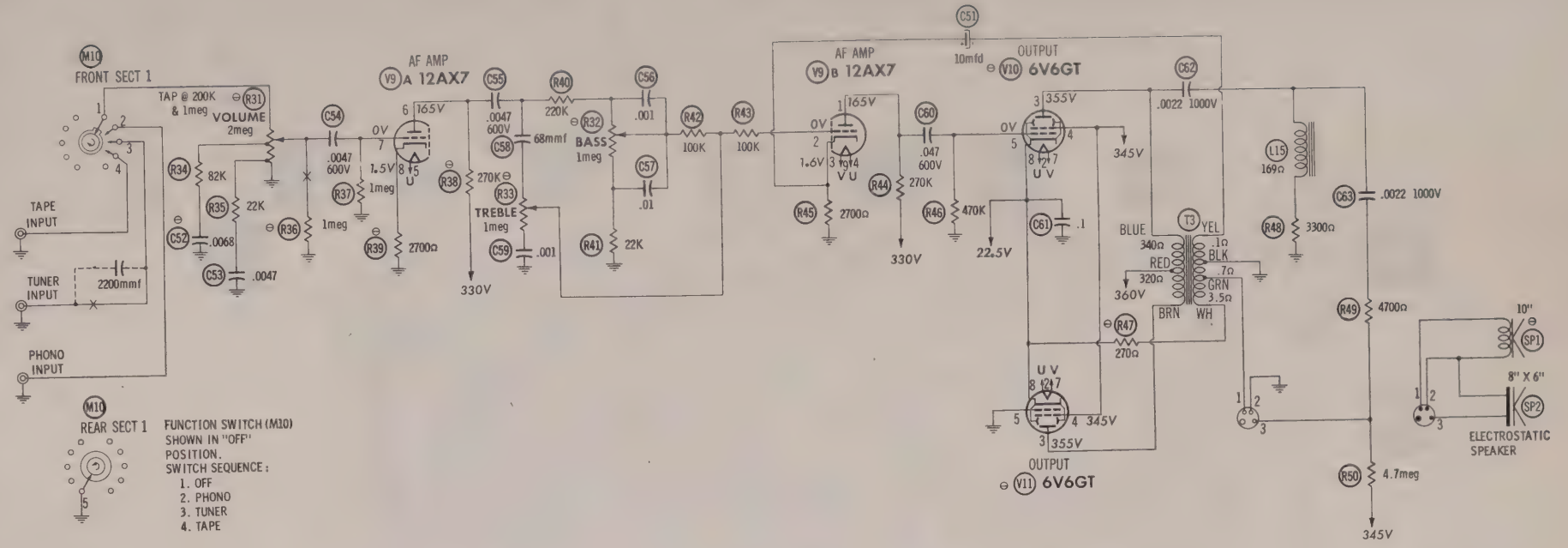
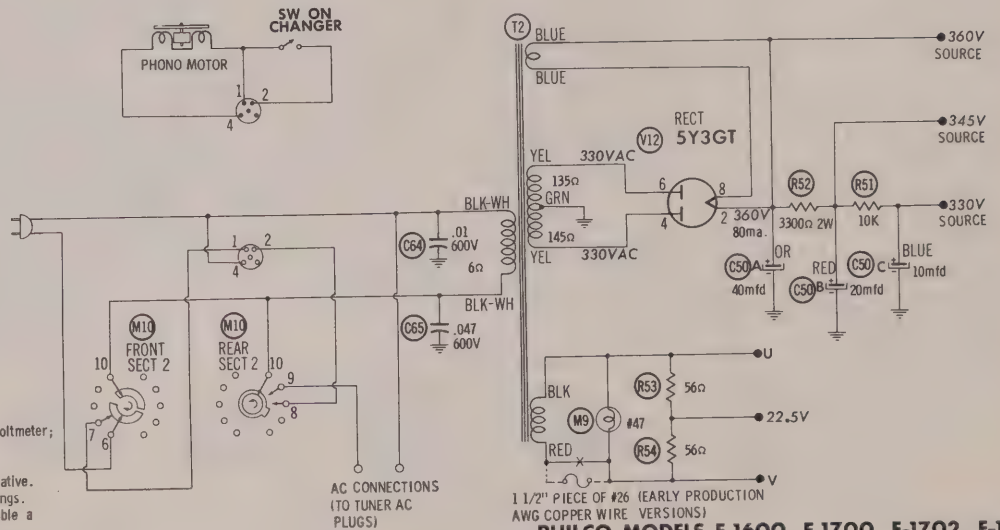
PHILCO MODELS F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1 (Ch. RT-100, RT-200, RT-201)

RT-100 TUNER SCHEMATIC





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	12AX7	††280K	220K	2700Ω	270Ω	270Ω	†† 280K	1meg	2700Ω	270Ω
V10	6V6GT	NC	270Ω	† 340Ω	† 3300Ω	470K	NC	270Ω	270Ω	
V11	6V6GT	NC	270Ω	† 320Ω	† 3300Ω	0Ω	TP	270Ω	270Ω	
V12	5Y3GT	NC	#	TP	145Ω	NC	135Ω	NC	#	

\# THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
†† MEASURED FROM PIN 2 OF V12.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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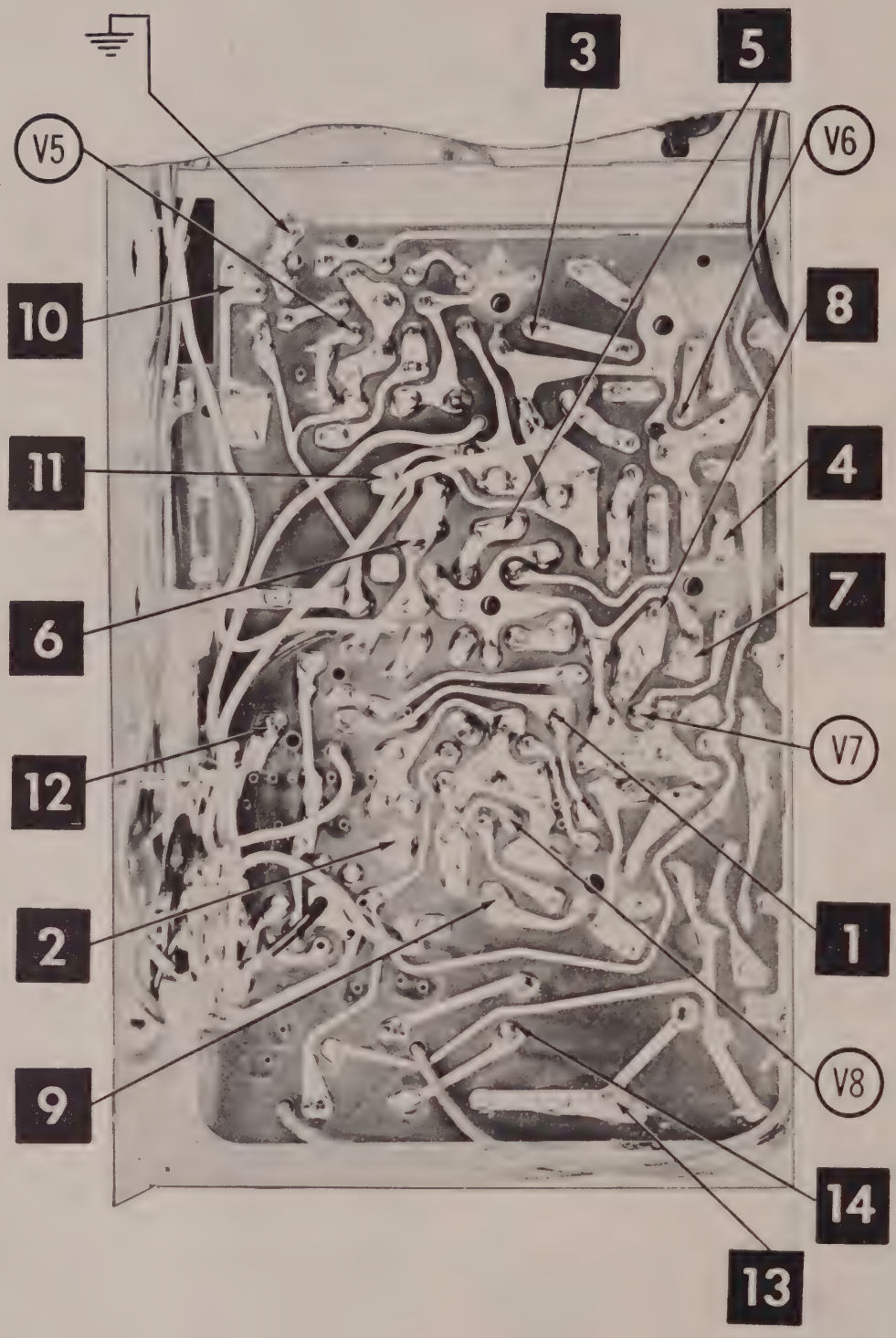
PHILCO MODELS F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1 (Ch. RT-100, RT-200, RT-201)

AMP SCHEMATIC

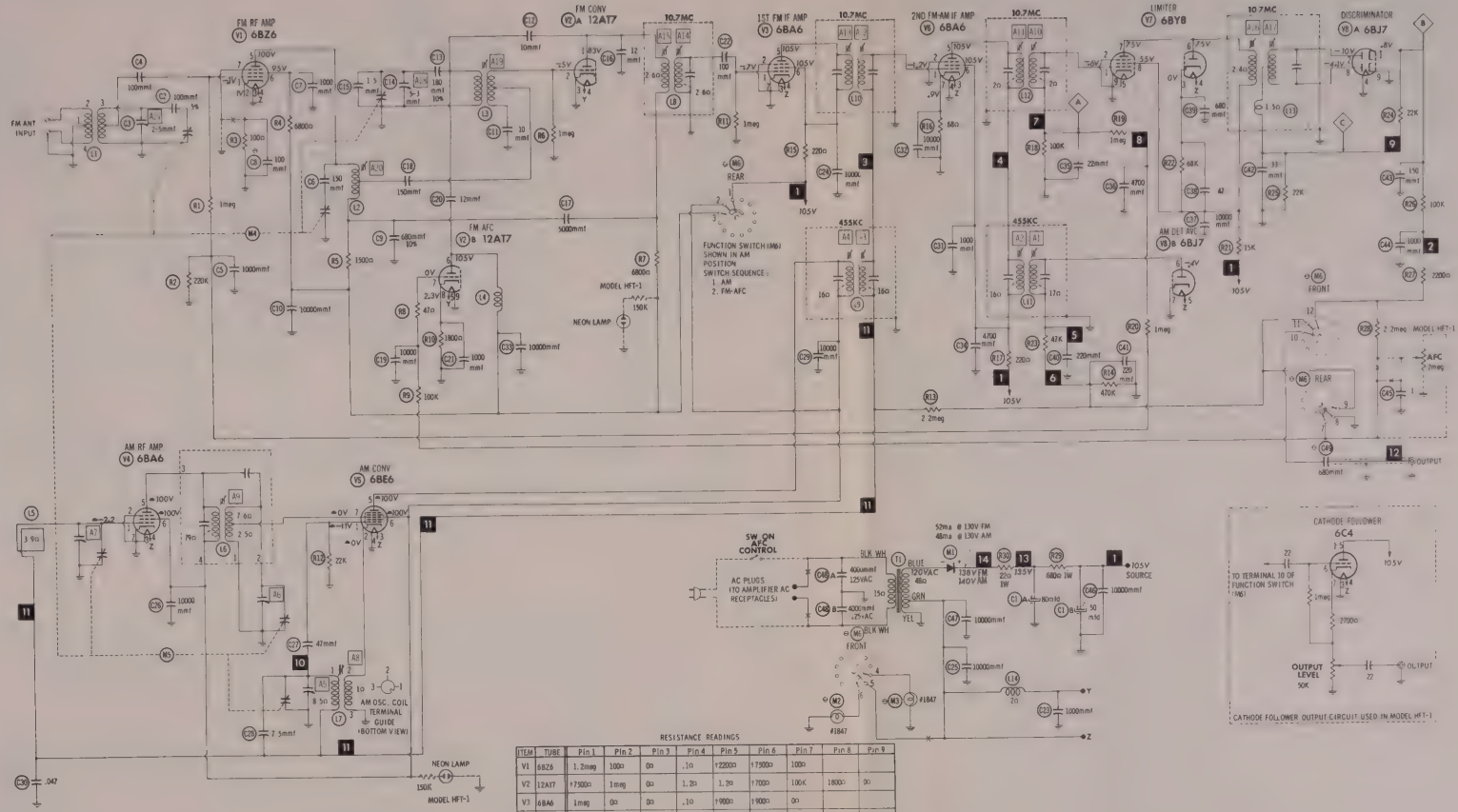
PHILCO
MODEL F-1600



A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.2meg	100Ω	0Ω	.1Ω	†2200Ω	†7500Ω	100Ω		
V2	12AT7	†7500Ω	1meg	0Ω	1.2Ω	1.2Ω	†700Ω	100K	1800Ω	0Ω
V3	6BA6	1meg	0Ω	0Ω	.1Ω	†900Ω	†900Ω	0Ω		
V4	6BA6	2.7meg	.0Ω	0Ω	1Ω	†200Ω	†200Ω	.0Ω		
V5	6BE6	22K	.1Ω	.1Ω	0Ω	†700Ω	†700Ω	2.5Ω		
V6	6BA6	2.7meg	0Ω	.1Ω	0Ω	†920Ω	†920Ω	68Ω		
V7	6BY8	100K	8Ω	†83K	.1Ω	8Ω	†15K	†15K	†15K	0Ω
V8	6BJ7	44K	22K	0Ω	0Ω	.1Ω	520K	0Ω	22K	0Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M6.
* MEASURED IN "AM" POSITION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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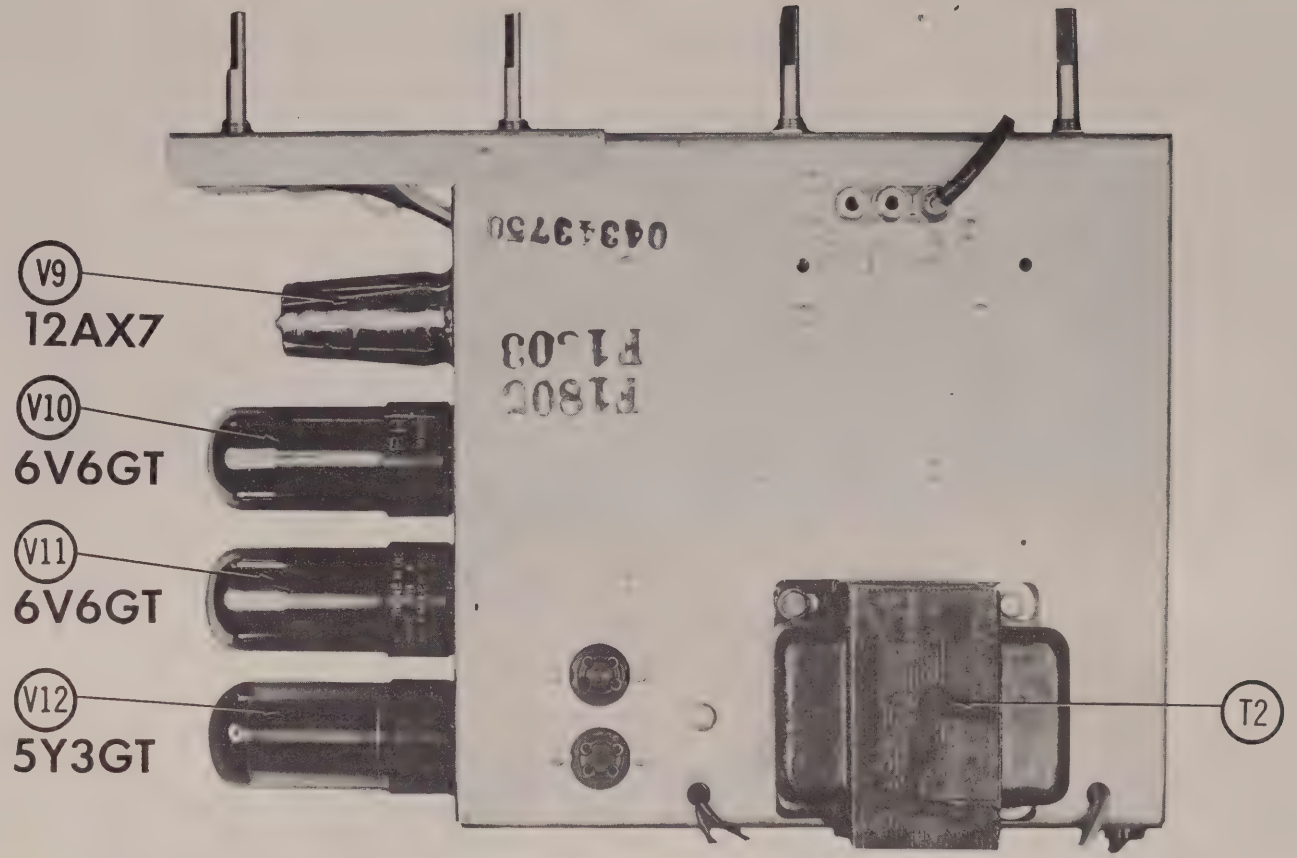
PHILCO MODELS F-1600, F-1700, F-1702, F-1802, F-1803, F-1805, HFT-1 (Ch. RT-100, RT-200, RT-201)

FM-AM TUNER SCHEMATIC



AMP CHASSIS - TOP VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V9	AF Amp.	12AX7	
V10	Output	6V6GT	
V11	Output	6V6GT	
V12	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C50A	40	450	30-2575-46	PR4-175	BBRQ222245	TCT3764		Q-055	TVA-4742
B	20	450							
C	10	450							
C51	10	25	30-2417-8	PRS25V10	BBR10-25	TT50X10	TD-10-25	MT-0210	TVA-1204

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	.0068	400	30-4650-57	P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	①
C53	.0047	400	30-4650-56	P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C54	.0047	600	30-4650-56	P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C55	.0047	600	30-4650-56	P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C56	.001	400	30-4650-52	P488N-001	D6-102	CUB4D1	GEM-421	6TM-D1	
C57	.01	400	30-4650-58	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C58	68		60-00685237	1468-000068	D6-680	5W5Q68	UC-5468	1FM-468	
C59	.001	400	30-4650-52	P488N-001	D6-102	CUB6D1	GEM-421	6TM-D1	
C60	.047	600	30-4650-62	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C61	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C62	.0022	1000	30-4650-88	P1088N-0022		CUB10D22	GEM-10222	10TM-D22	
C63	.0022	1000	30-4650-88	P1088N-0022		CUB10D22	GEM-10222	10TM-D22	
C64	.01	600	30-4650-58	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C65	.047	600	30-4650-47	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

① Model F-1600 may use .0033mfd ② 400V in this application (Part #30-4650-55).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R31	2meg	½	33-5535-47					Volume, Tap ② 200K & 1meg, Note 1
R32A	1meg	½	33-5587-29	B-70	A47-1meg-Z	QJ3-137	U53	Bass, Note 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R33A	1meg	½	33-5587-29	B-70	A47-1meg-Z	QJ3-137	U53	Treble, Note 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

Note 1. Alternate Part #33-5535-44.

Note 2. Alternate Part #33-5587-18.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PHILCO PART No.	NOTES
R34	82K		66-3828340	
R35	22K		66-3228340	
R36	1meg		66-5108340	Note 1
R37	1meg		66-5108340	
R38	270K		66-4278340	Note 2
R39	2700Ω		66-2278340	Note 3
R40	220K		66-4223340	
R41	22K		66-3228340	
R42	100K		66-4108340	
R43	100K		66-4108340	
R44	270K		66-4278340	
R45	2700Ω		66-2278340	
R46	470K		66-4478340	
R47	270Ω	(WW)	33-1335-91	Note 4
R48	3300Ω		66-2338340	
R49	4700Ω		66-2478340	
R50	4.7meg		66-5478340	
R51	10K		66-3108340	
R52	3300Ω	2	66-2335340	
R53	56Ω		66-0568340	
R54	56Ω		66-0568340	

Note 1. Not used in some versions.
Note 2. Some versions may use 100K in this application (Part #66-4108340).
Note 3. Some versions may use 2200Ω in this application (Part #66-2228340).
Note 4. Some versions may use 330Ω in this application (Part #66-1338340).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L15	Crossover Choke	32-4628					100 Millihenries

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V	660VCT	5V	32-8790	P9310 ①	P-3152 ②		PC8422 ①	24R04U ①	R-11A ①
	② .65A	② .080A	② 2A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ②1.1A									

① Drill new mounting hole. ② Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	9000Ω CT	15Ω tap ② 3-4Ω & 1Ω	32-8791							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3-4Ω	36-1653-4 ①	10A6A	① Used in Models F-1802, F-1803, F-1805
SP2	8" x 6"	Electrostatic		36-1656		② Used in Models F-1600, F-1700, F-1702
	8"	PM	3-4Ω	36-1651-8 ②	8A31	③ Used in Model F-1600 only.
	6"	Acoustic Resonator		36-1661 ③		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PHILCO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M7		89-TB				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M8		†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M9	Lamp	34-2068	#47
M10	Switch	42-2080	Function, Rotary, Wafer Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA

PHILCO MODELS F-1900, F-1902

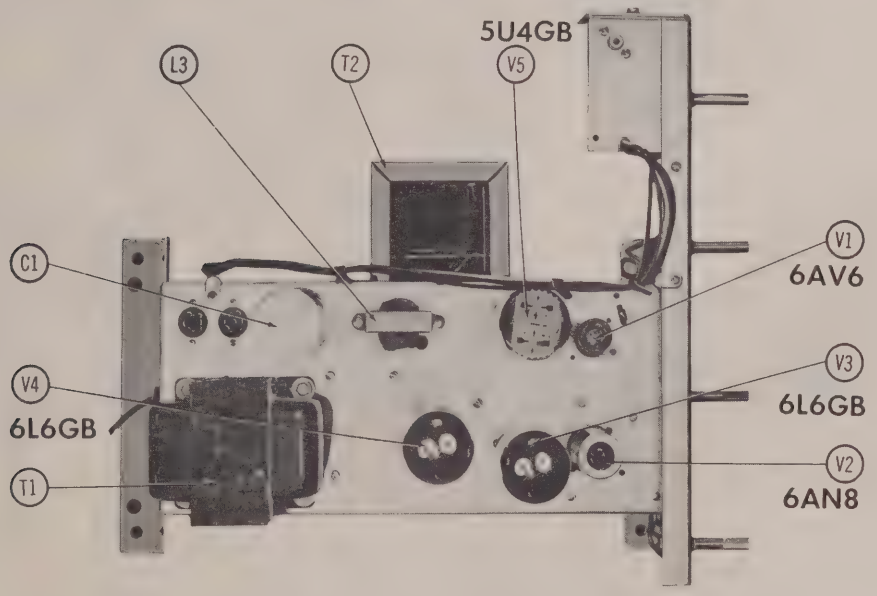
PHILCO MODELS
F-1900, F-1902

MODEL F-1900

PHILCO MODELS
F-1900, F-1902

TRADE NAME	Philco Models F-1900, F-1902
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Model F-1900: AC Operated Phono Amplifier With 4 Speed Automatic Record Changer * Model F-1902: AC Operated FM-AM Tuner, Amplifier And 4 Speed Automatic Record Changer
TUBES (Five)	Types 6AV6 AF Amplifier, 6AN8 AF Amp.-Phase Inv., (2) 6L6GB Output, 5U4GB Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.06 Amp. @ 117 Volts AC (110 Watts) Less Motor

* FOR SERVICE INFORMATION ON FM-AM TUNER RT-200-1 SEE PHOTOFACT SET 427 FOLDER 9
FOR SERVICE INFORMATION ON RECORD CHANGER -- SEE PHILCO M-39--
PHOTOFACT SET 362 FOLDER 6 OR RECORD CHANGER MANUAL RC-10



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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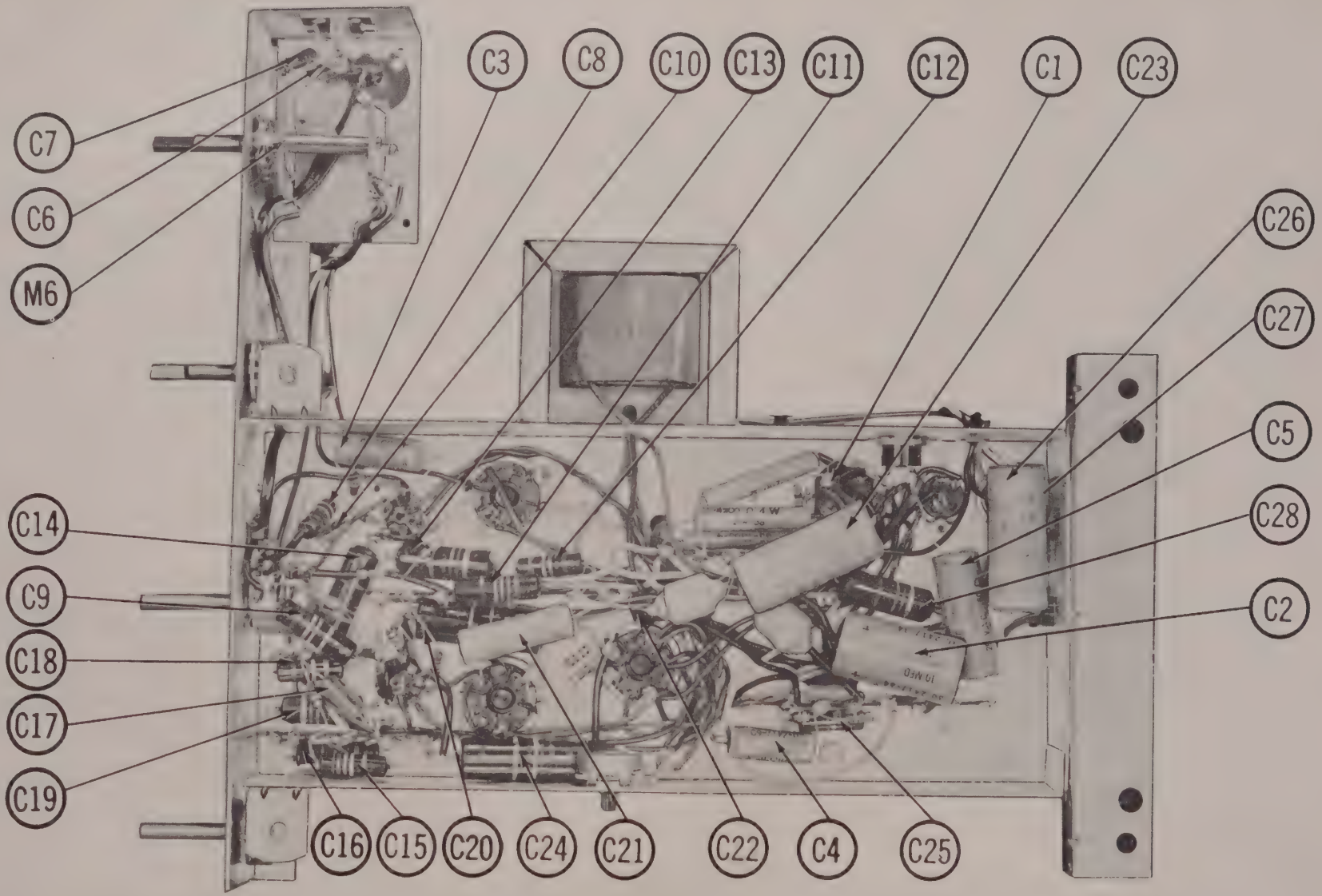
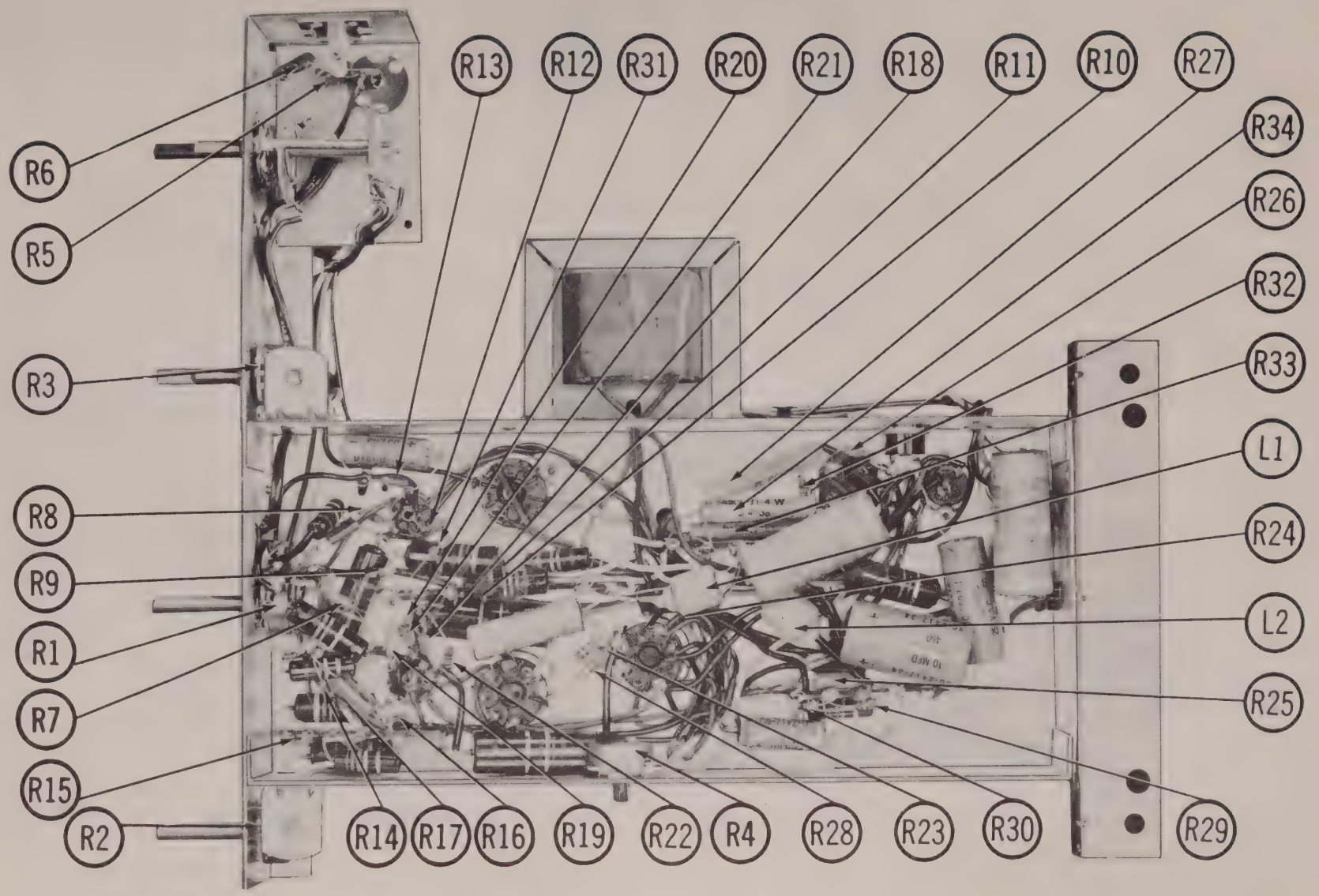
SET 427 FOLDER 10



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6AV6	
V2	AF Amp. -Phase Inv.	6AN8	

ITEM No.	USE	TYPE	NOTES
V3	Output	6L6GB	
V4	Output	6L6GB	
V5	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	30-2584-36	AFH4-85-25	D0655	FP431.3	TMQ-99	Q-410	TVL-4746
B	■30	450					TD-25-50	MT-0525	
C	▲10	450							
D	50	50							
C2	10	450	30-2417-34	PRS450V10	BR1045	TC72	TD-10-450	MT-4510	TVA-1705
C3	25	25	30-2417-60	PRS25V25	EBR25-25	TC36	TD-25-25	MT-0225	TVA-1205
C4	25	25	30-2417-60	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205
C5	12	25AC	30-2593-1	NP-PRS25V10	BBR25-25 †	TC36 †	TD-25-25 †	MT-0225	R2691 *
					BBR25-25	TC36	TD-25-25	MT-0225 †	

* Not normally in distributors stock. Available thru distributor on order to manufacturer
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	82		60-00825317	1469-000082	DD-820	22R5Q82		MS-482	10%
C7	120		30-1257-9	1469-00012	DD-121	22R5T12		MS-312	10%
C8	.0022	400	30-4651-23						10%
C9	.015	400	30-4650-42						10%
C10	25		60-00245307	1469-000025	DD-250	22R5Q25	MCB220	MS-425	10%
C11	.022	400	30-4650-43						10%
C12	.01	400	30-4650-41				GEM-1611		10%
C13	.047	600	30-4650-62	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C14	.047	600	30-4650-62	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C15	.0022	400	30-4651-23						10%
C16	.022	400	30-4651-22						10%
C17	68		60-00685417	1469-000068	DD-680	22R5Q68		MS-468	10%
C18	.001	400	30-4650-52				GEM-1621		10%
C19	.047	400	30-4650-45	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	Note 1
C20	.15	400	30-4650-48	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C21	.022	1000	30-4650-94	P1088N-022		CUB10S22	GEM-10122		

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C22	.012	1000	30-4651-29						10%
C23	.22	600	30-4678-66	P688N-22		CUB6P22	GEM-6022	6TM-P22	
C24	.15	400	30-4650-48	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C25	.001	400	30-4650-52				GEM-1621		10%
C26	.22	600	30-4650-49	P688N-22		CUB6P22	GEM-6022	6TM-P22	
C27	.01	600	30-4650-58	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C28	.047	600	30-4650-62	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

Note 1. Not used in Runs 51 or 52.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	33-5573-32			Q11-137		Loudness
B	1meg	½				M13-137		Loudness
R2A	1meg	½	33-5587-14	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	33-5587-14	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	200Ω	½	33-5572-39	AB-2		B11-201		Hum Bal.
B	Shaft			AK-1		SK2		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R5	1.5meg		66-5158340	
R6	1meg		66-5108340	
R7	22K		66-3228340	
R8	1meg		66-5108340	
R9	1meg		66-5108340	
R10	820K		66-4828340	
R11	820K		66-4828340	
R12	270K		66-4278340	
R13	2700Ω		66-2278340	
R14	220K		66-4228340	
R15	22K		66-3228340	
R16	100K		66-4108340	
R17	100K		66-4108340	
R18	270K		66-4278340	
R19	680K		66-4688340	Note 1

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R20	2200Ω		66-2228340	
R21	47K		66-3478340	
R22	47K		66-3478340	
R23	220K		66-4228340	
R24	4700Ω		66-2478340	
R25	2200Ω	1	66-2224340	
R26	4.7meg		66-5478340	
R27	200Ω	7	33-1335-141	
R28	220K		66-4228340	
R29	1800Ω 5%		66-2188340	
R30	47Ω 5%		66-0478340	
R31	10K		66-3108340	
R32	10K		66-3108340	
R33	35K	7	33-1363-4	
R34	4200Ω	4(WW)	33-1360-1	

Note 1. Some versions may use 100K in this application (Part #66-4108340)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS

ITEM No.	USE	REPLACEMENT DATA					
		PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Crossover Choke	32-4628					100 Micronenries
L2	Crossover Choke	32-4628-1					200 Micronenries

CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L3		.3Ω	.0012HY	32-8774						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @1.06A	680VCT @.130A	5V @2.7A	32-8775-2		P-3173①		PC8422①	22R06②	R-16A①
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @2.4A									

① Drill New Mounting Holes
② Use Universal Mounting Brackets Supplied With Transformer

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5700Ω CT	6-8Ω	32-8826-1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	15"	PM	6-8Ω	36-1666	15A10L	
SP2	11"x4"	Electrostatic		36-1665		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	325-8016	89-TBX				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	JENSEN PART No.	WALCO PART No.	
M2	325-8017	† S-66 or †♦ S-66SD or ♦ S-66D	† W-77TPS or †♦ W-77DS or ♦ W-77TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Lamp	34-2031-4	#1847
M4	Lamp	34-3031-4	#1847
M5	Lamp	34-2031-4	#1847
M6	Switch	42-2081	Function, Rotary, Wafer Type
M7	Switch	41-4250-1	Bin Light, Includes Cable Assembly

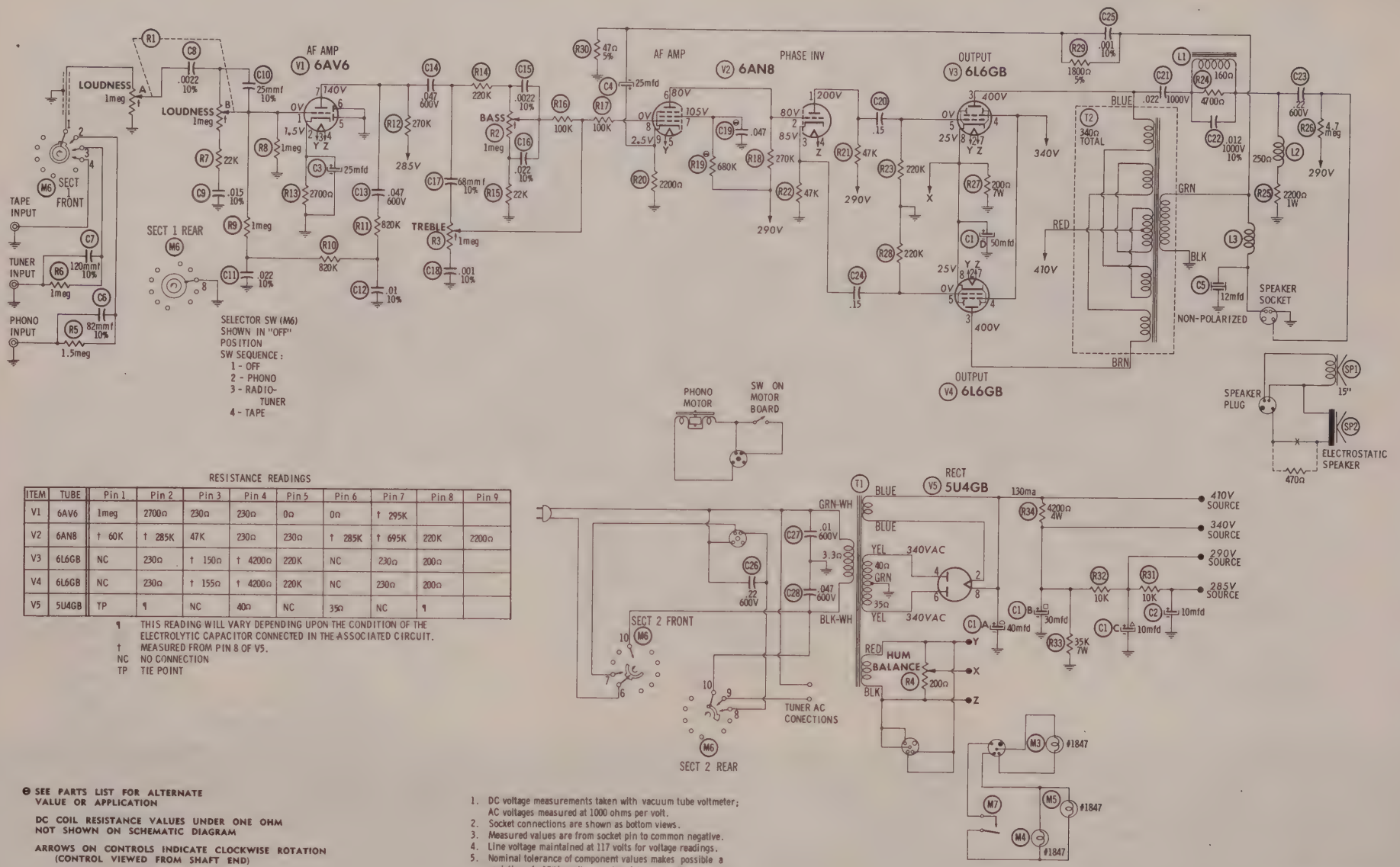
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	54-6271-1	4 Used
Cabinet	11220-4	Mahogany, Model F-1900
Cabinet	11220-5	Blond, Model F-1900
Cabinet	11220-6	Fruitwood, Model F-1900
Cabinet	11299	Mahogany, Model F-1902
Cabinet	11299-1	Blond, Model F-1902
Cabinet	11299-2	Fruitwood, Model F-1902

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	1meg	2700Ω	230Ω	230Ω	0Ω	0Ω	† 295K		
V2	6AN8	† 60K	† 285K	47K	230Ω	230Ω	† 285K	† 695K	220K	2200Ω
V3	6L6GB	NC	230Ω	† 150Ω	† 4200Ω	220K	NC	230Ω	200Ω	
V4	6L6GB	NC	230Ω	† 155Ω	† 4200Ω	220K	NC	230Ω	200Ω	
V5	5U4GB	TP	¶	NC	40Ω	NC	35Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PHILCO MODELS F-1900, F-1902

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PILOT MODELS PT-1015, PT-1025

PILOT MODELS
PT-1015, PT-1025

MODEL PT-1015

PILOT MODELS
PT-1015, PT-1025

TRADE NAME	Pilot Models PT-1015, PT-1025
MANUFACTURER	Pilot Radio Corp., 37-06 36th Street, Long Island City 1, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Six)	Types 12AX7 Preamplifier, 12AX7 AF Amplifier, 12AX7 AF Amplifier-Phase Inverter, (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .62 Amp. @ 117 Volts AC (63 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #108-32 - SEE GARRARD RC121/4 - PHOTOFACT SET 355 FOLDER 4 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H706

SET 427 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp. - Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450	24-149	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	■20	450							
C	▲20	450							
D	20	450							
C2A	▲40	400	24-150	AFH3-140	C1040	FP385	TMT-140	T-735	TVL-3754.2
B	■10	400							
C	▲100	50							
C3	2	50NP		NP-PRS50V2	BBR4-50 † BBR4-50 †	TC30 † TC30 †	TD-4-50 † TD-4-50 †	MT-0504 † MT-0504 †	R2233 *

† Connect negative leads together.
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C5	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C6	.033	400							10%
C7	.022	400							10%
C8	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C9	1000					1R5D1	MCB255	MS-21	10%
C10	1800					1R5D18		MS-218	10%
C11	30					C10Q3U			N750 10%
C12	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C13	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C14	50					C10Q5U			N750 10%
C15	1800					1R5D18		MS-218	10%
C16	1200					1R5D12		MS-212	10%
C17	.047	400							10%
C18	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C19	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C20	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C21	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C22	.0051	400							①

① Some versions may use .022mfd in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	36-63	BT-73	A47F-1meg	Q13-137X	UT-438	Volume, Tap ③ 250K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Power On-Off
R2A	5meg	½	37-36				■UE3839	Treble
B	5meg	½						Bass
R3A	25K	½	39-44	AB-26	A47-25K-S	B11-120	TA253L	Hum Balance
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.
■ "STA-LOC" Equivalent : FA56A, OS1062, RU56A, IS1562.

CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	NOTES
R4	47K			
R5	680K			
R6	68K	1		
R7	1000Ω	1		
R8	330K			
R9	1meg			
R10	8200Ω 5%			
R11	100K			
R12	82K			
R13	82K	1		
R14	1500Ω	1		
R15	4.7meg			
R16	15K			
R17	120Ω			
R18	39K			
R19	82K	1		
R20	2200Ω			
R21	220K			
R22	220K			
R23	680K			
R24	39K			

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	NOTES
R25	4700Ω			
R26	100K			
R27	100K			
R28	82K	1		
R29	2200Ω			
R30	680K			
R31	100K 5%			
R32	1500Ω			
R33	22K			
R34	100K 5%			
R35	1500Ω			
R36	270K			
R37	270K 5%			
R38	12K 5%			
R39	27K	1		
R40	270Ω 5%	5(WW)		
R41	39K			
R42	10K			
R43	5600Ω	2		
R44	100Ω	2		
R45	4.7Ω	1		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .62A	650VCT @ .070A	5V @ 1.7A	55-47	P9305	P-2951 ①		PM8408	22R37 ①	
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.8A									

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	10K CT	6-8Ω	56-42	Z1404 ①	A-2904①	AU-609①	A-3335 ①	26S59 ①	S-19Z ①	① Drill new mounting hole.

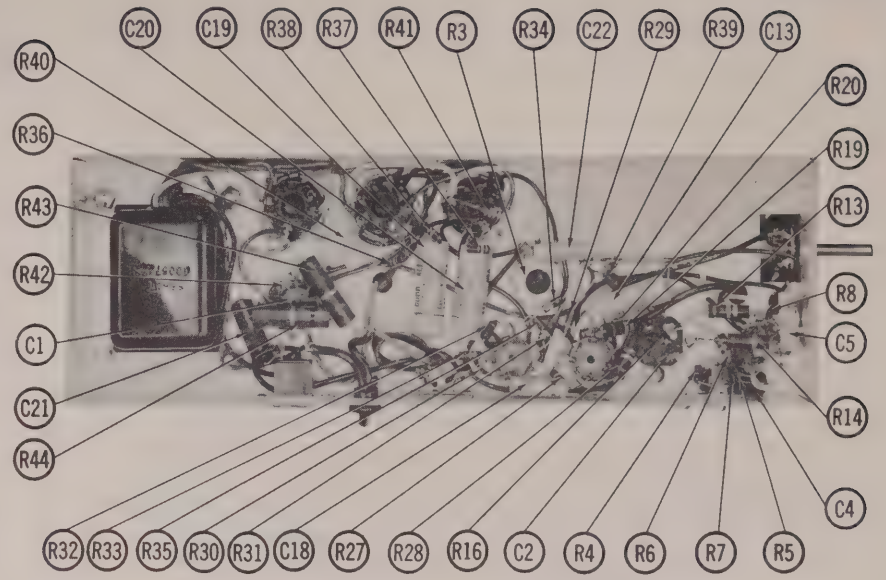
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PILOT PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	41-39	8A6	
SP2	6"	PM	3-4Ω	41-40	6A21	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PILOT PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1						

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

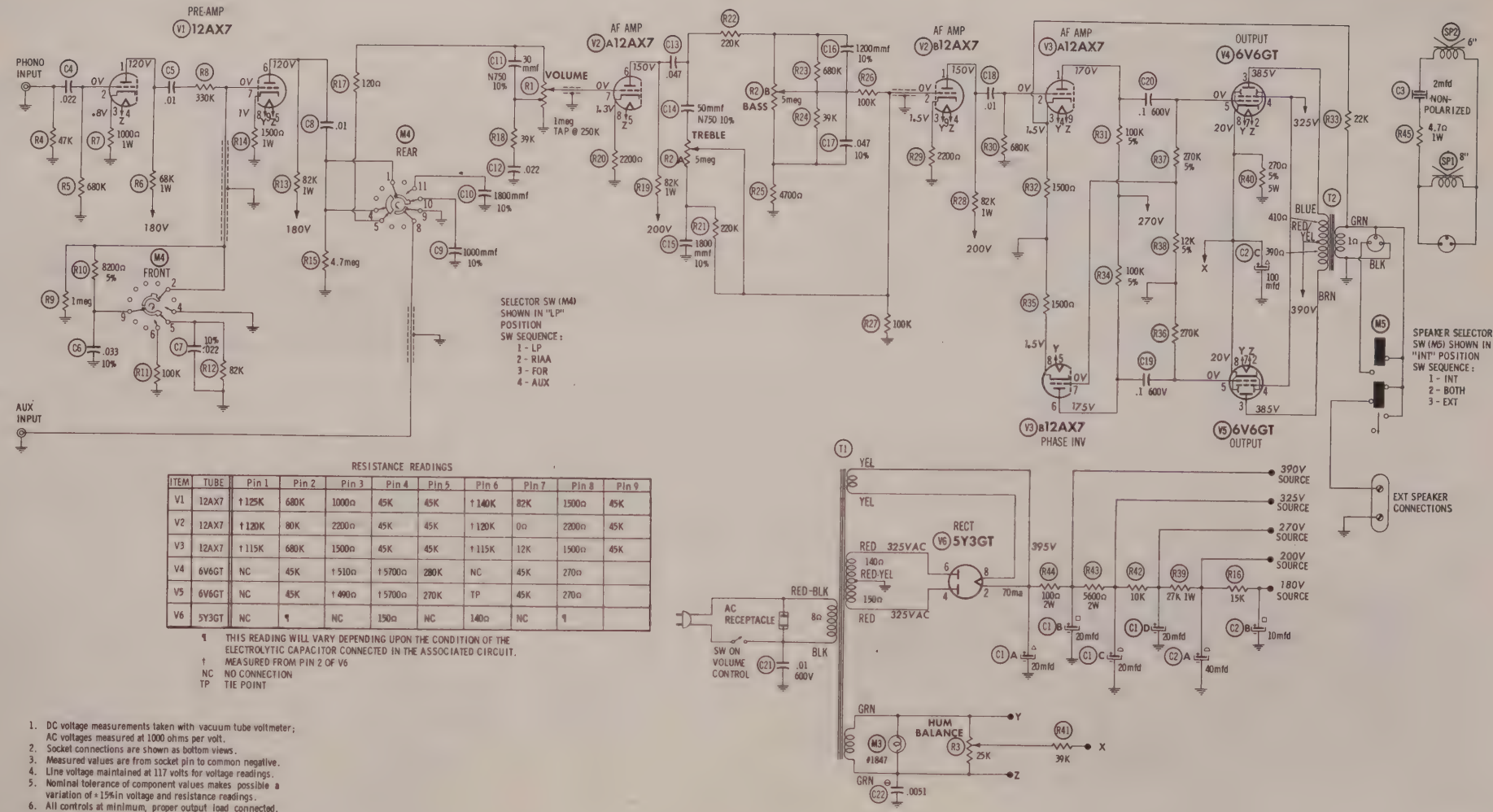
ITEM No.	REPLACEMENT DATA PILOT PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	(STD)	† G-6 or ♦ G-6D	† 69S or ♦ 69D	† Jewel ♦ Diamond
	(LP)	† G-4 or ♦ G-4D	† 69MGS or ♦ 69MGD	

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M3	Lamp	68-10	#1847
M4	Switch	100-110	Compensation, Rotary, Wafer Type
M5	Switch	101-42	Speaker, SPDT, Slide Type

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†125K	680K	1000Ω	45K	45K	†140K	82K	1500Ω	45K
V2	12AX7	†120K	80K	2200Ω	45K	45K	†120K	0Ω	2200Ω	45K
V3	12AX7	†115K	680K	1500Ω	45K	45K	†115K	12K	1500Ω	45K
V4	6V6GT	NC	45K	†510Ω	†5700Ω	280K	NC	45K	270Ω	
V5	6V6GT	NC	45K	†490Ω	†5700Ω	270K	TP	45K	270Ω	
V6	5Y3GT	NC	¶	NC	150Ω	NC	140Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 2 OF V6
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PILOT MODELS PT-1015, PT-1025

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

**TELECTRO
MODEL 1970**

TELECTRO
MODEL 1970

TELECTRO
MODEL 1970

GENERAL INFORMATION

Telectro Model 1970 tape recorders record and play back two tracks of material on standard-width recording tape, thus doubling playing time of a 3" or 5" reel with no loss of frequency response or quality. The Model 1970 has two speeds, 3 3/4 and 7 1/2 ips.

Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from a microphone.

Using both tracks of tape, recording times are as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
3" (300 ft.)	1/2 hour	1/4 hour
5" (600 ft.)	1 hour	1/2 hour

Connect this recorder to an outlet supplying 110-120 volts, 60 cycles AC only. Before connecting to line supply, be certain it agrees with these specifications.

MANUFACTURED BY:
Telectrosonic Corporation
35-18 37th Street
Long Island City, New York

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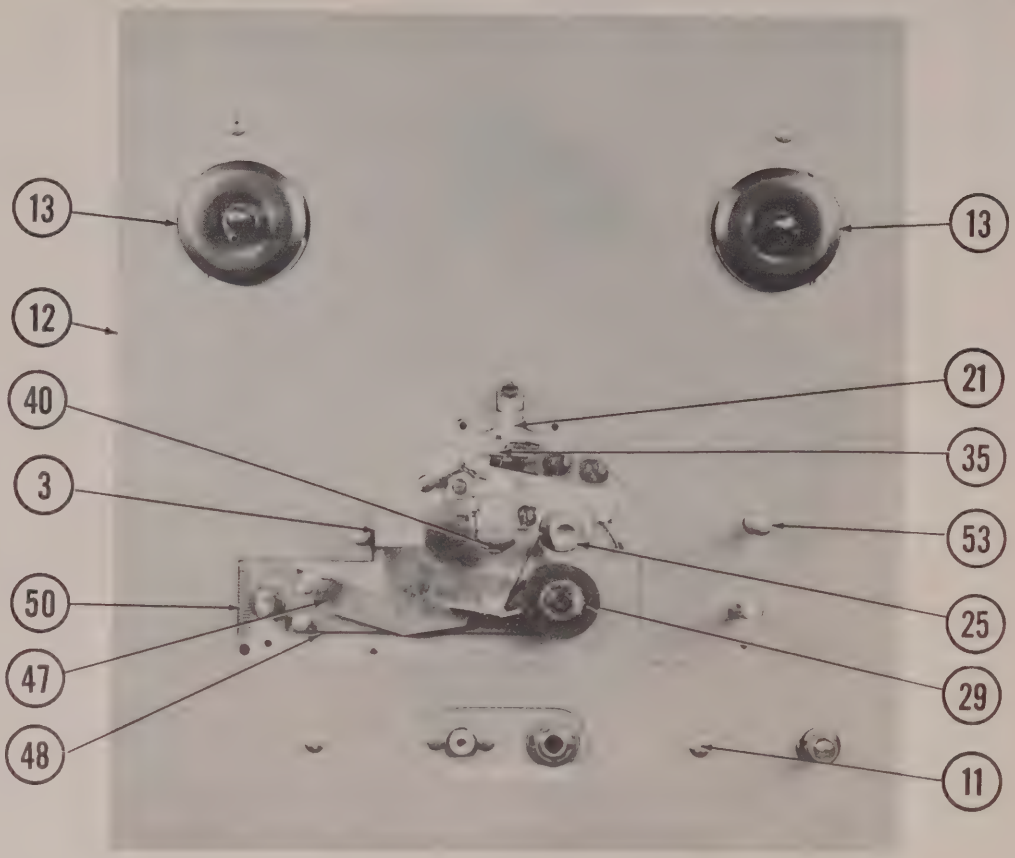


FIG 1. TOP VIEW OF TRANSPORT MECHANISM

PREPARING FOR OPERATION

1. Open cover and remove power cord, microphone, empty reel, and reel of tape from storage space at rear of unit.
2. Remove cover by unlocking hinges. Place unit so that controls are accessible and at a convenient height.
3. Plug power cord into any AC outlet having proper frequency and power requirements.
4. Recorder is now ready for use. Before operating, the operator should familiarize himself with the controls.

FUNCTION OF CONTROLS

Function Control

Idle is neutral, or stationary, tape position. Turn knob to left for Play. To record, depress Record button and hold while turning function selector knob to right.

IMPORTANT: When recorder is not in use, function selector knob must be in Idle.

Wind-Rewind Control

Turn control to right for fast wind; to left for fast rewind. Before operating Wind-Rewind knob, function selector knob must be placed in Idle.

Speed Change Control

For 7 1/2 ips, put speed change control in down position; for 3 3/4 ips, in up position. Do not change speeds unless function selector knob is in Idle.

OPERATING INSTRUCTIONS

Threading Tape

1. Place a reel of tape on left (supply) spindle and an empty reel on right (take-up) spindle, making sure reel slots engage pins on spindle.
2. Unwind approximately 12 inches of tape from left (supply) reel. Hold a section of tape

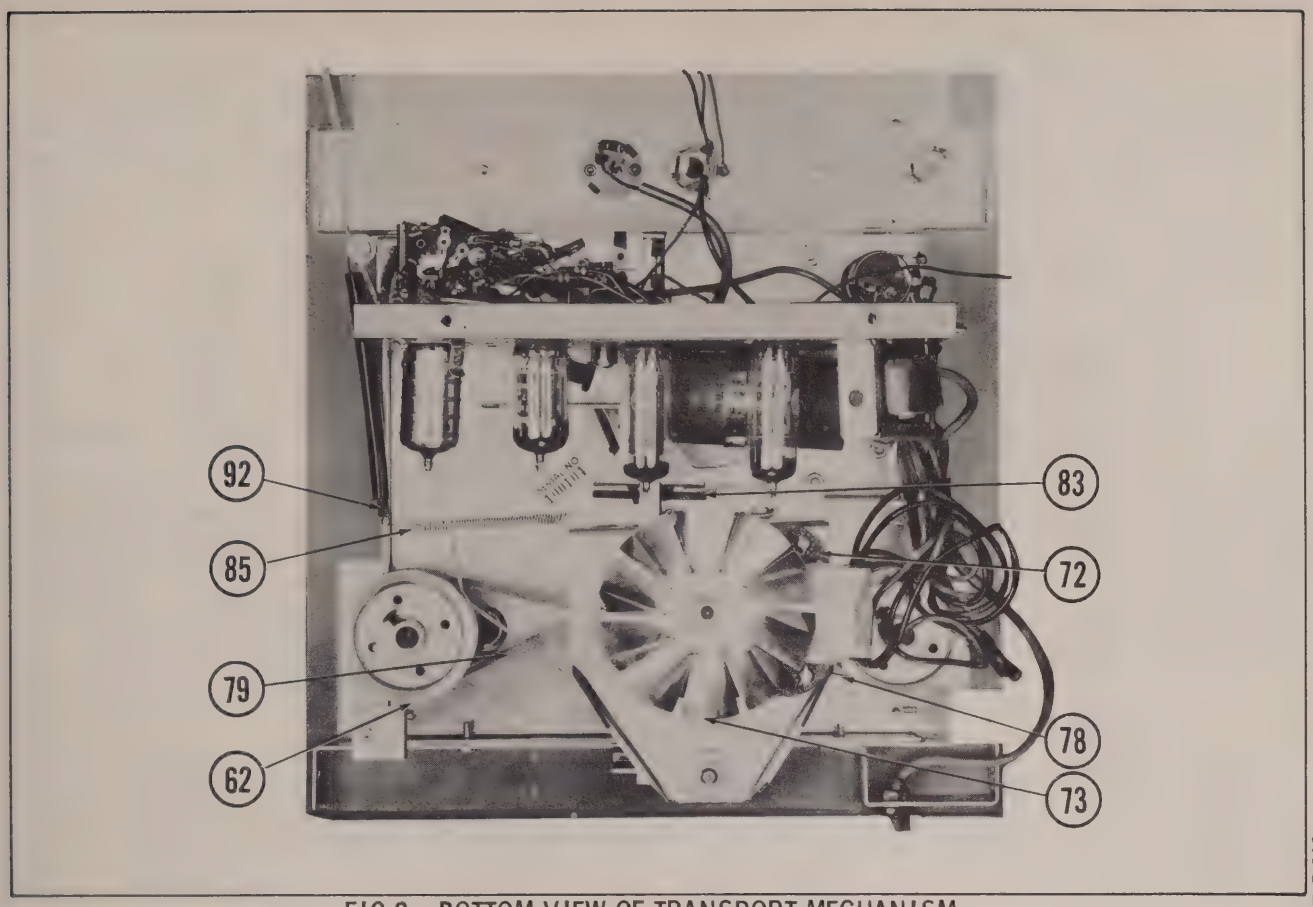


FIG 2. BOTTOM VIEW OF TRANSPORT MECHANISM

taut and insert in tape slot, making sure dull-coated side of tape faces rear of recorder.

3. Insert free end of tape into one of three radial slots in hub of empty reel. Turn reel several turns clockwise until tape is secured to reel and all slack is taken up between reels.

To Record

Plug line cord into a convenient wall receptacle and insert microphone into input jack on top of recorder. Turn On-Off-Volume control clockwise until a click is heard and allow sufficient time for unit to warm up. Thread tape as described under "Threading Tape." Turn function selector knob to Record. Adjust Volume control until recording level indicator flashes on high peaks only. To record from radio, phonograph, or television, follow this same procedure, keeping recorder volume at a normal level. To stop tape, turn function selector knob to Idle.

To Wind Or Rewind Tape

1. Turn function selector knob to Idle.

2. To wind tape onto reel, turn Wind-Rewind control to right and hold. Release knob when you reach the desired section of the tape.

3. To rewind tape, turn Wind-Rewind control to left. It locks into position. To stop rewind, return the Wind-Rewind knob to its center position.

To Play a Recording

1. Turn On-Off-Volume control clockwise until a click is heard and allow sufficient time for unit to warm up.

2. Turn function selector knob to Play.

3. Adjust Volume control for desired listening level.

4. Turn function selector knob to Idle to stop tape.

CAUTION: Do not set function selector knob to Record when Play is desired, because previously recorded portion of tape will be automatically erased.

Erasing Recorded Material

Any recording on tape is automatically erased before a new recording is put on tape when unit is in Record. To erase a recording without putting anything on tape, follow normal recording procedure, but leave Volume control at its extreme counterclockwise position.

To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other track, recordings to be edited should be limited to one track only.

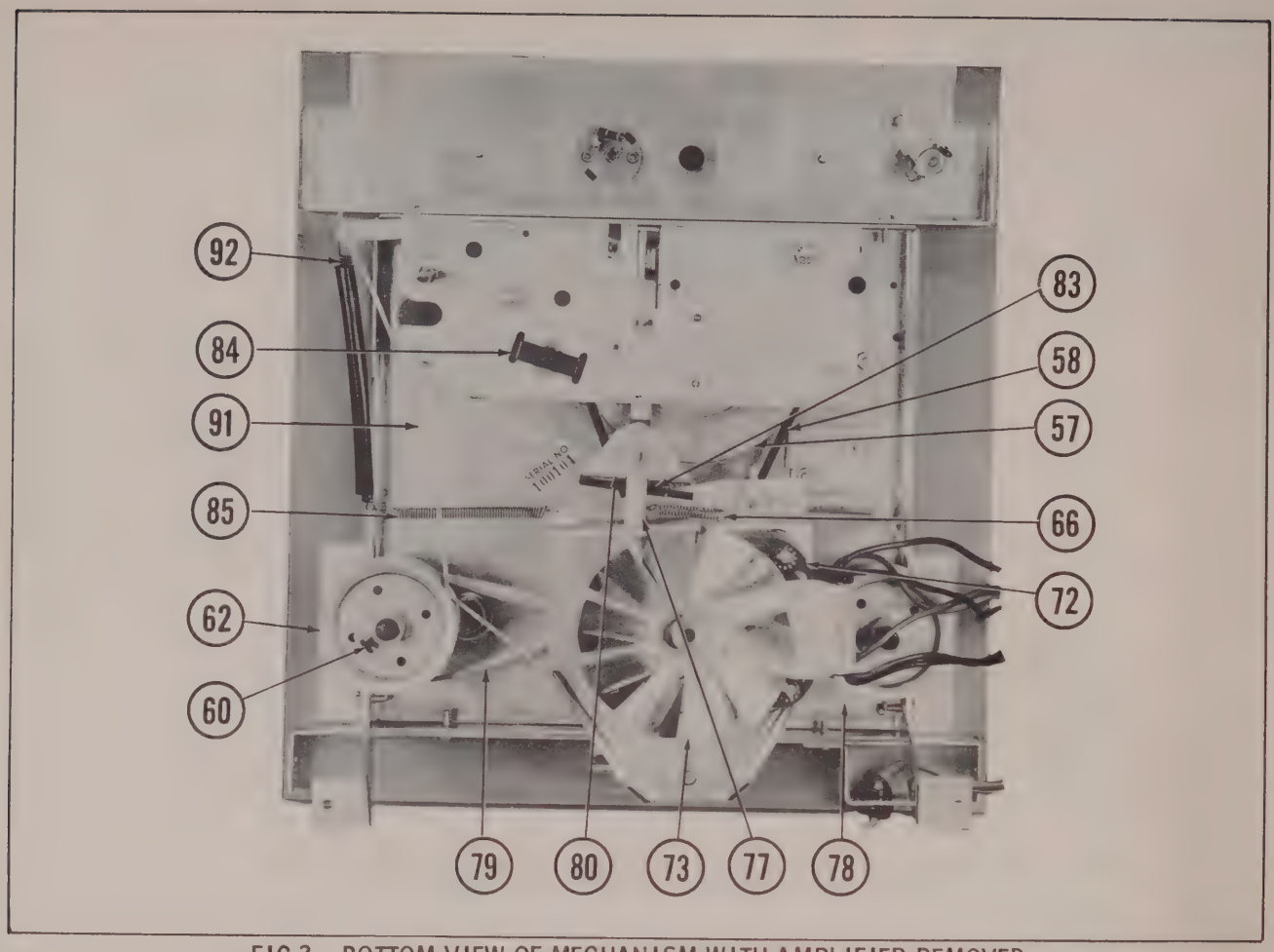


FIG 3. BOTTOM VIEW OF MECHANISM WITH AMPLIFIER REMOVED

1. Tape may be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements may be inserted between selections etc. Unused sections can be spliced for re-use.

2. For best results, cut tape at a slight diagonal, join ends with splicing tape on glossy side, and trim any excess width.

Dual-Track Recording

One-half the tape width is recorded at a time, thereby resulting in two-track recording. This two-track operation is accomplished in the following manner:

1. After a reel of tape has been recorded and all tape wound onto right reel, turn function selector knob to Idle.

2. Remove reels from recorder; turn full reel over and place it on left spindle.

3. Properly thread tape and proceed with recording.

4. After second track has been recorded, first track can be played without rewinding by reversing reel, as described in step 2.

DISASSEMBLY

To Remove Recorder From Cabinet

1. Remove four screws on bottom of cabinet.

2. Remove four screws (two on each side) on side of cabinet.

3. Lift unit and disconnect speakers.

4. Remove unit from cabinet.

To Remove Amplifier From Tape Transport

1. Disconnect head leads.

2. Remove speaker jack.

3. Disconnect microphone input.

4. Disconnect sound level indicator light.

5. Remove two hex nuts holding amplifier to tape transport.

LUBRICATION

All moving parts have self-lubricated oilite bearings. Therefore, in normal use no lubrication is necessary. When unit is disassembled, clean all bearings with a clean, soft cloth and apply a thin film of oil on bearing surfaces.

CLEANING

Capstan roller assembly (29), capstan shaft, and recording head (40) may accumulate tape oxide coating, worn off tape as it passes these parts. This accumulation will cause poor performance and should be removed with a soft cloth dipped in alcohol.

MECHANICAL ADJUSTMENTS

Play-Record Head

Recording head (40) must be aligned with tape. If it is not, low output, loss of high frequencies, or track overlap may result.

CAUTION: The play-record head was adjusted and sealed in place at the factory. Further adjustment is unnecessary unless head becomes faulty and needs replacing. Two adjustments should be made:

1. Head height should be adjusted so that top edge of tape aligns evenly with top edge of record head lamination. To adjust, loosen nuts (39A) and slightly raise or lower recording head (40).
2. To adjust head for maximum frequency response, head adjustment screw (36) should be turned to left or right. This moves head from side to side slightly until maximum high frequencies are obtained. After adjusting, head height should be checked.

Erase Head

Erase magnet assembly (45) should be adjusted so that erase magnet affects top half of recorded tape. This adjustment should be made in Record position and by loosening erase magnet adjusting screw (44) in erase head. Erase magnet assembly (45) is then moved up or down till only the top half of tape is affected. When properly adjusted, only top half of tape will be erased.

Brake Release Bracket

Brake release bracket (80) can be adjusted by loosening screw (81) and moving bracket forward or backward. When bracket (80) is moved to rear of recorder, wind-rewind lever assembly (83) contacts release bracket (80), giving brake cord (91) more slack. For less slack in brake cord (91), reverse the foregoing adjustment.

Spindle End Play

Spindles should have 1/32" to 1/16" up and down movement. Loosen set screw (60) in upper pulley assembly (61) and move pulleys up or down until correct amount of end play is obtained.

TROUBLE CHART

Symptom	Cause	Remedy
Fails to erase.	1. Erase magnet adjusting screw (44) in erase magnet assembly (45) loose, causing erase head to remain in Play or Idle position.	1. See "Erase Head Adjustment".
	2. Interlock shaft assembly (84) fails to go down far enough to let interlock slide (90) slide to one side. Function selector knob will not go into Record position when this occurs.	2. Check for binding.
No drive on record or playback.	1. Rubber drive belt (58) loose or broken.	1. Replace drive belt (58).
	2. Take-up belt (78) loose or broken.	2. Replace take-up belt (78).
	3. Defective motor (72).	3. Replace motor (72).
	4. Connecting leads fouling fan assembly (73).	4. Dress leads so they will not contact fan assembly (73).

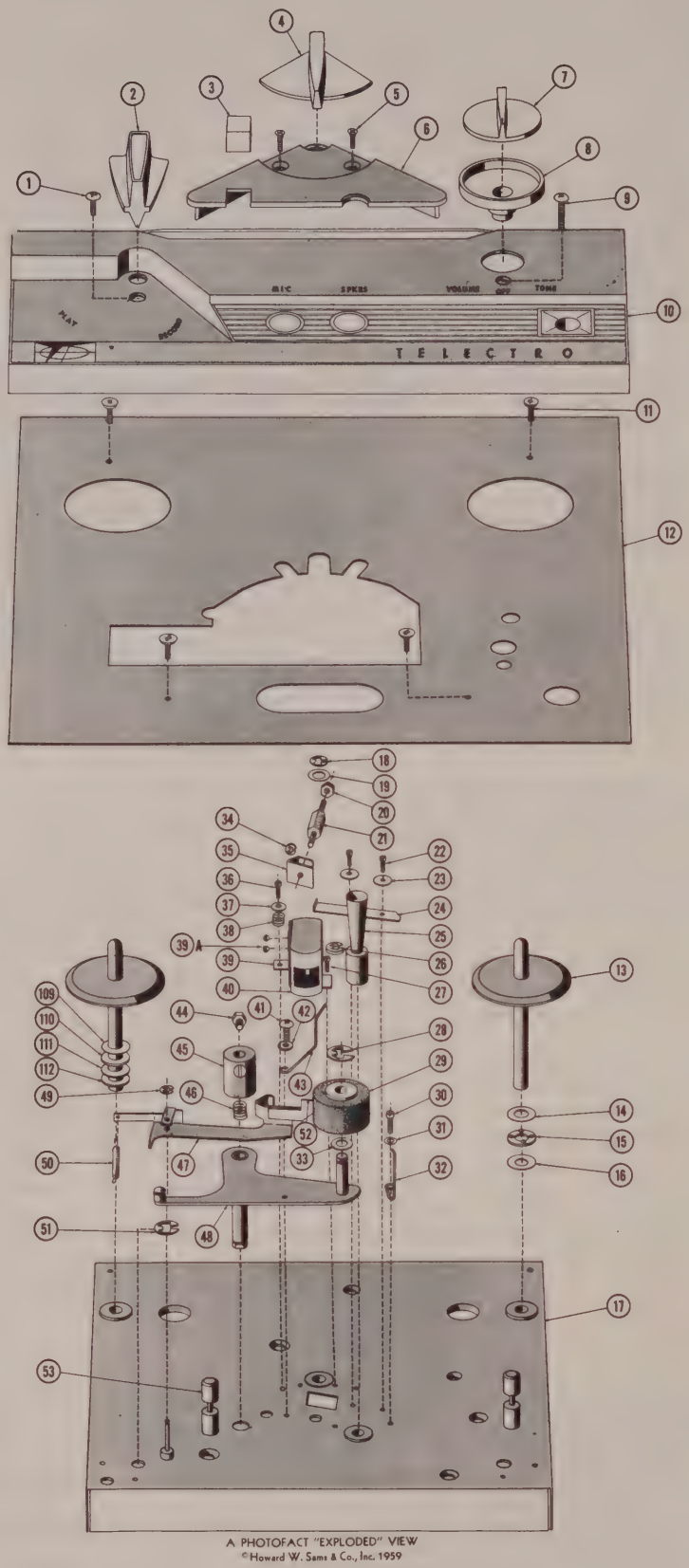


FIG 4A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE

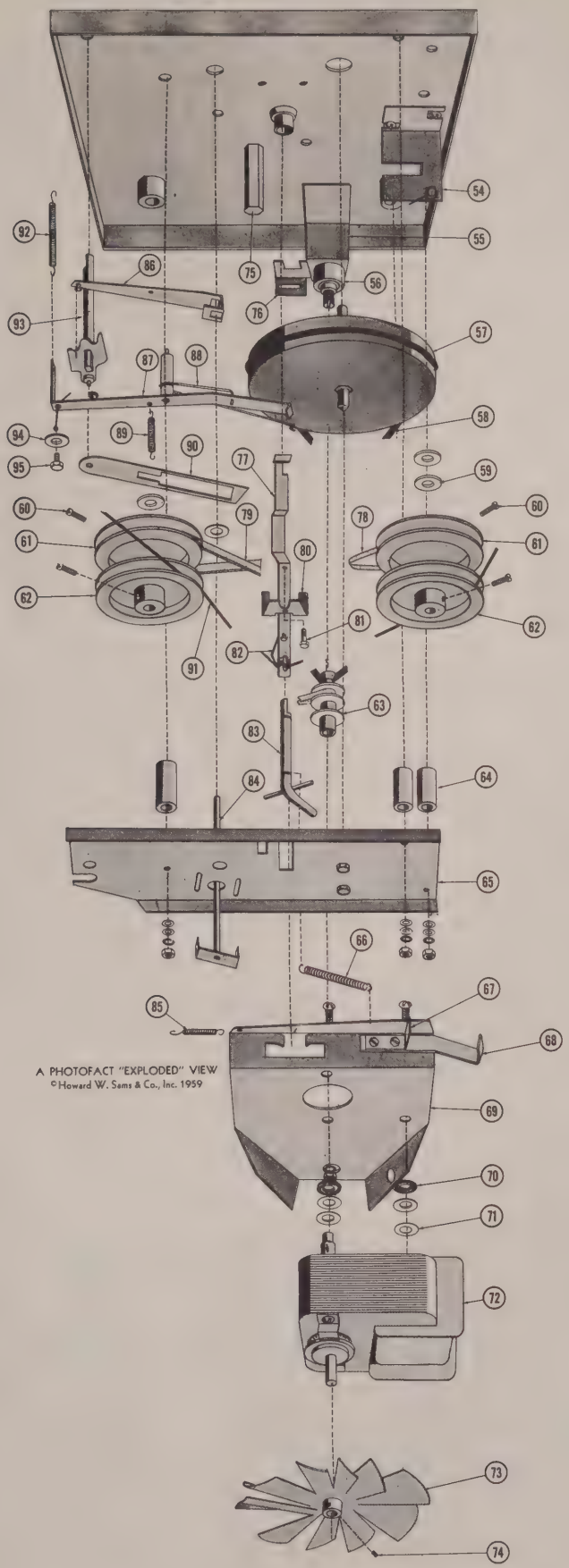


FIG 4B. EXPLODED VIEW OF PARTS BELOW BASEPLATE

TROUBLE CHART (Con't)

Symptom	Cause	Remedy
	5. Flywheel and capstan shaft binding.	5. Clean and lubricate flywheel and capstan shaft.
	6. Take-up spring (85) disconnected or defective.	6. Reconnect or replace spring.
Speed variation, or wow.	1. Dirty or oily capstan sleeve assembly (25), capstan roller assembly (29), and motor pulley (63).	1. Clean with soft cloth and alcohol.
No wind or rewind.	1. Drive belt (58) loose or broken.	1. Replace drive belt (58).
	2. Take-up belt (78) or rewind belt (79) loose or broken.	2. Replace take-up belt (78) or rewind belt (79).
	3. Oil or grease on driving surfaces.	3. Clean with soft cloth and alcohol.
Function control does not operate.	1. Brake spring (88) broken or disconnected.	1. Replace or connect brake spring (88).

MECHANICAL PARTS LIST

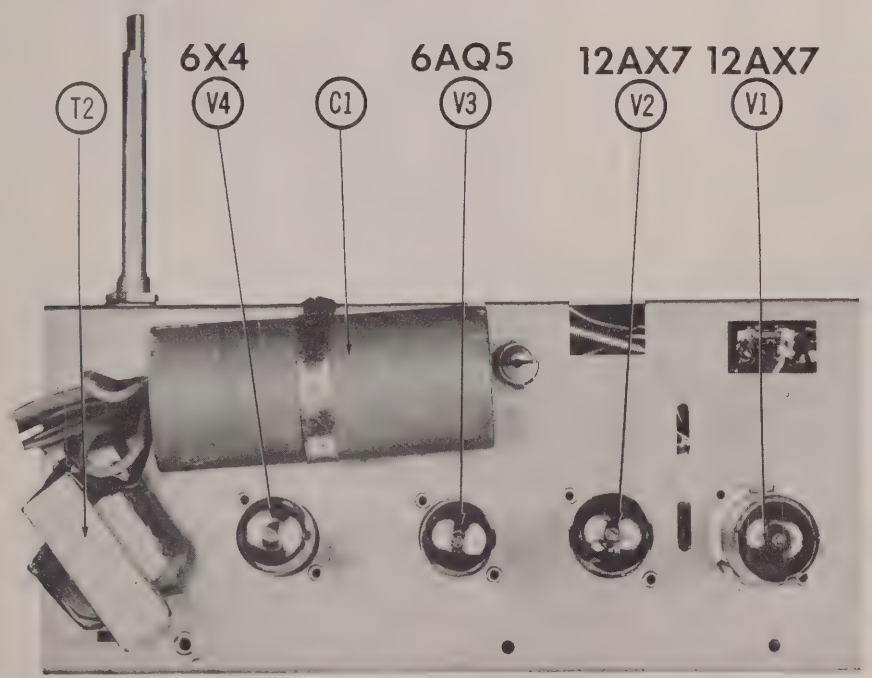
Ref. No.	Part No.	Description
1		6-32 x 3/4 Fl. Phil. Hd. M. Scr. Brass Pl.
2	TA-1202	Function Selector Knob
3	TA-1203	Record Knob
4	TK-243	Wind-Rewind Knob
5		6-32 x 1-1/8 Fl. Phil. Hd. M. Scr. Stl. Brass Pl.
6	TE-274	Rear Escutcheon
7	TA-1201	Volume Control Knob
8	TK-241	Tone Control Knob
9		6-32 x 1 1/8 Fl. Phil. Hd. M. Scr. Stl. Brass Pl.
10	TA-1185	Front Escutcheon
11		6-32 x 5/16 Lg. Truss Phil. Hd. M. Scr. Stl. Br. Pl
12	TP-994	Motor Board Dress Plate
13	TA-1105	Spindles
14		.315 I.D. x 9/16 O.D. x .010 Washer
15	TB-809	Bearing Ball Thrust
16		.315 I.D. x 9/16 O.D. x .010 Washer
17		Not a replacement part
18	5103-25	Wind-Rewind Lever Retaining Ring
19		Wind-Rewind Lever Washer .255 I.D. x 1/2 O.D. x .010 Flat
20		6-32 Hex Nut
21	TP-983	Hex Shaft
22		6-32 x 3/16 Screw
23		Lock Washer No. 6
24	TS-1854	Spring
25	TA-1204	Capstan Sleeve Assy. with Retaining Rings (2)
26	5000-25	Capstan Sleeve Assembly Retaining Ring

Ref. No.	Part No.	Description
27		Head Adj. Screw, 2-56 x 5/16
28	5133-25	Pressure Roller Retaining Ring
29	TA-1002	Capstan Roller Assembly
30		Screw #6 x 1/4 Lg. Hex Slotted Sht. Met. Type Z
31		Not used
32	TG-414	Tape Guide, Upright
33		Pressure Roller Washer 255 I.D. x 1/2 O.D. x .010
34	5133-12	Retaining Ring
35	TL-344	Wind-Rewind Latch
36		Head Adj. Screw, 2-56 x 7/16
37		Washer #2 Flat
38	TS-1755	Record Head Spring
39	TB-901	Recording Head Mtg. Bracket
39A		Recording Head Mtg. Nut #2 Hex
39B		#2 Flat Washer Rec. Head Mtg. Wash.
40	TH-494	Recording Head
41		Tape Release Guide Mtg. Screw. 440 x 3/16 Phil.
42		Not Used
43	TG-419	Tape Release Guide
44		Erase Magnet Adj. Screw 6-32 x 1/4 Hex Slotted
45	TA-1123	Erase Magnet Assembly
46	TS-1659	Erase Magnet Return Spring
47	TA-1125	Pressure Pad Bracket Ass'y.
48	TA-1186	Capstan Roller Plate Ass'y.
49	5133-12	Pressure Pad Bracket Assembly Retaining Ring
50	TS-1931	Pressure Pad Spring
51	5133-25	Function Control Retaining Ring
52	TP-863	Record Head Pressure Pad

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
53	TT-712	Tape Guide Post
54	TB-619	Bracket Excursion Limit
55	TB-878	Bearing Motor Pivot Bracket
56	TB-635	Bearing Motor Pivot
57	TF-304	Flywheel Assembly
58	TO-171	Linear "O" Ring Drive Blet
59		Washer .315 x 1/2 O.D. x .062 Filer
60		Set Screw 6-32 x 3/16 Round Hd. Mach. Scr.
61	TA-265	Upper Pulley Assembly
62	TA-1183	Lower Pulley Assembly
63		Not supplied separately
64	TS-1630	Spacer, Motor Board Sub Plate
65	TA-1205	Motor Board Sub Plate
66		Not Used
67	TB-879	Rewind Stop Bracket
68	TH-515	Excursion Limit Hook
69	TB-862	Motor Mounting Bracket
70	TM-416	Motor Shock Mount
71		Washer #6 Flat
72	TA-1129	Motor & Pulley Assembly
73	TA-1206	Fan Assembly
74		8-32 x 3/16 Slotted Fan Set Screw
75	TS-1270	Drop Spacing Stud
76	TB-859	Brake Rod Guide Bracket
77	TA-1128	Brake Rod Sub Assembly
78	TB-998	Takeup Belt
79	TB-999	Rewind Belt
80	TB-858	Brake Release Bracket
81		Screw #6 x 1/4 Sheet Metal Type Z
82	TS-1658	Brake Spring
83	TA-1121	Wind-Rewind Lever Assembly
84	TA-1207	Interlock Shaft Assembly

Ref. No.	Part No.	Description
85	TS-2022	Spring Takeup
86	TA-1122	Capstan Roller Plate Cam Lever Assembly
87	TA-1004	Switch Detent Lever Assembly
88	TS-1657	Brake Rod Return Spring
89	TS-1681	Capstan Roller Plate Lever Spring
90	TS-1625	Interlock Slide
91	TB-1004	Brake Cord (25" long)
92	TS-1905	Switch Detent Lever Spring
93	TA-1119	Switch Shaft & Cam Assembly
94		Washer #6 Flat Washer
94A		Washer #6 Flat Washer
95		Screw #6 x 1/4 Sheet Metal Type Z
96	TC-1694	Vol. Control, Tone & Switch
97	TC-1510	Osc. Coil
98	TT-714	Output Transformer
99	TC-1717	Electrolytic Capacitor
100	TS-1670	Switch Wafer
101	TL-174	NE 51 Neon Lamp
102	TC-1710	A.C Line Cord & Plug
103	TH-544	Heyco Line Cord Retaining Bushing
104	TS-1926	5" Speaker
105	TS-1927	4" Speaker
106	TC-1610	Case & Cover
107	TC-1692	Trim channel baffle board
108	TJ-185	Switching Jack
109		one .315 I.D. x 1/2 O.D. x .032 Thk. Fibre Washer
110		one Steel Washer .315 I.D. x 9/16 O.D. x .010 Flat
111		one .315 I.D. x 1/2 O.D. x .032 Fibre Washer
112		one Steel Washer .315 I.D. x 9/16 O.D. .010 Flat



AMPLIFIER CHASSIS - TOP VIEW

TELECTRO MODEL 1970

FOLDER 12

ELECT PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Pre Amplifier	12AX7/ ECC83
V2	AF Amp. -Indicator Amp.	12AX7/ ECC83
V3	Bias Osc-Output	6AQ5
V4	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TELECTRO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	120	300		PR4-450	BBRT0196				TVA-3563
B	40	300							
C	10	300							
C2	5	15		PRS50V5	BBR5-50	TT25X5	TD-5-25	MMT-0505	TVA-1203
C3	50	6		SRE6V5	BBR50-6	TT6X50	TD-50-6	MQ-650	TVA-1100

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TELECTRO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	.02	300		P488N-02	D6-203	CUB4S2	GEM-412	4TM-S2	
C7	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C8	.02	300		P488N-02	D6-203	CUB4S2	GEM-412	4TM-S2	
C9	200			BPD-0002	DD-201	L10T2	UC-532	5GA-T2	
C10	.003	300		P488N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C11	30				DD-300	L10Q3		MS-43	10%
C12	.003	300		P488N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C13	200			BPD-0002	DD-201	L10T2	UC-532	5GA-T2	
C14	800					1D3D8	MC251	1FM-38	①
C15	.02	600		P688N-02	D6-203	CUB6S2	GEM-612	6TM-S2	

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TELECTRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	15K	½	TC-1694	F1-27			■ UE3905S	Tone
B	500K			R2-41				Volume
C	Switch			KB-1 or KR-1*				Power On-Off

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.
■ STA-LOC Equivalent: FA153L, OS2562, RU55A, IS3000, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TELECTRO PART No.	NOTES
R2	4.7meg			
R3	12meg			①
R4	220K			
R5	680Ω			
R6	220K	1		
R7	2000Ω			②
R8	100K			
R9	2000Ω			②
R10	4.7meg			
R11	390K			

ITEM No.	RATING OHMS	RATING WATT	TELECTRO PART No.	NOTES
R12	1meg			
R13	100K			
R14	220K			
R15	470K			
R16	270Ω	1		
R17	2700Ω			
R18	68K			
R19	100Ω			
R20	100Ω			
R21	10meg			③

① Some versions may use 10meg in this application.
② Some versions may use 2200Ω in this application.
③ Not used in some versions.

COILS

ITEM No.	USE	REPLACEMENT DATA TELECTRO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.						

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TELECTRO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .84A	275V@ .050A	6.3V@ 1.3A	TM-396A ①						

① Power transformer used as tape drive motor.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TELECTRO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4600Ω	3-4Ω	TT-714	Z1107	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

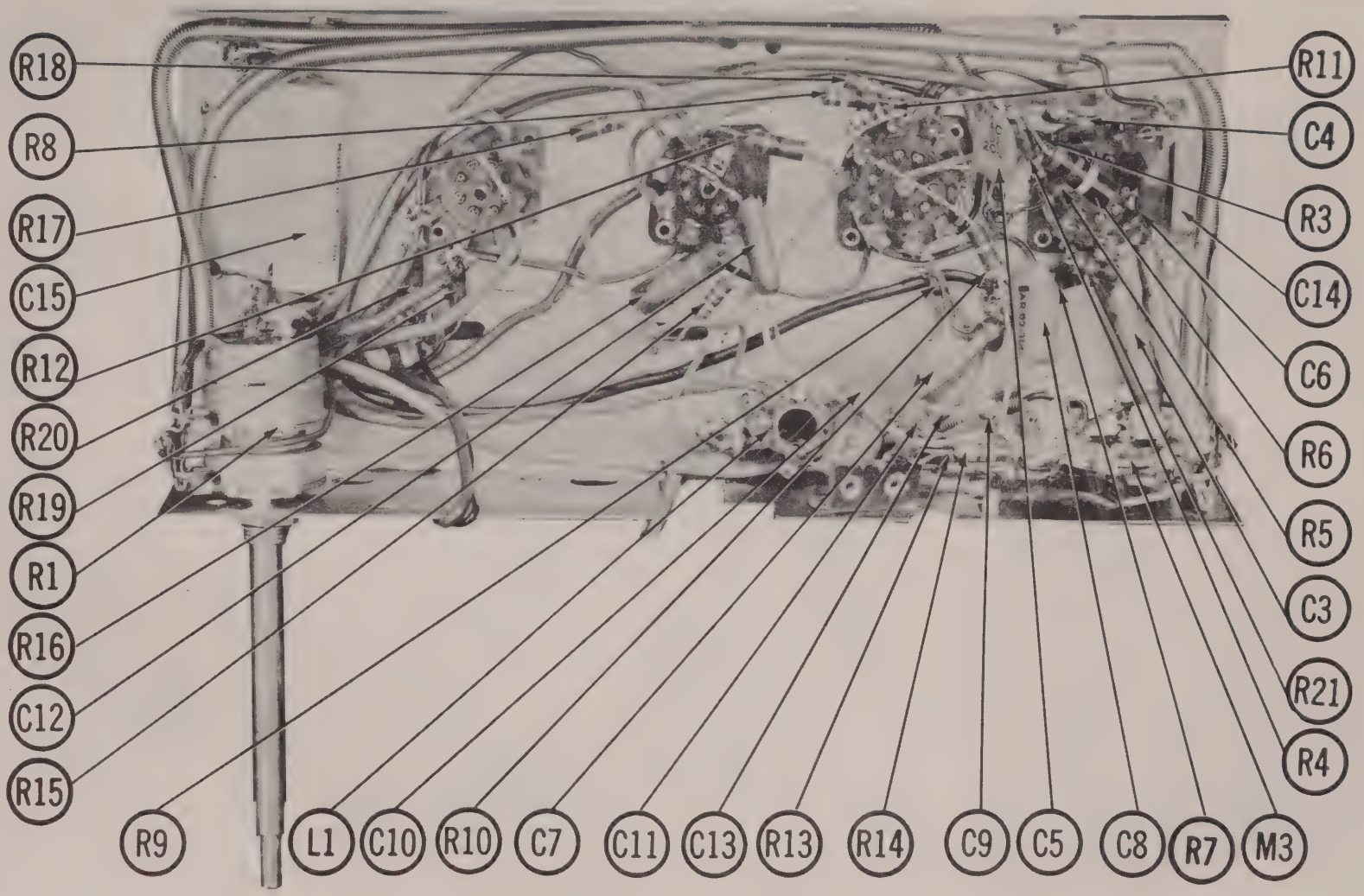
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TELECTRO PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	TS-1926	5A1	
SP2	4"	PM	3-4Ω	M468.5	4A07	

MISCELLANEOUS

ITEM No.	PART NAME	TELECTRO PART No.	NOTES
M1	Head		Play Record, Michigan Magnetics #10L17
M2	Lamp		#NE51, Record Level
M3	Switch		Record-Idle-Play, Rotary, Wafer Type
M4	Motor	TM-396A	115 Volts, 60 Cycle (Part of Power Transformer T1)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

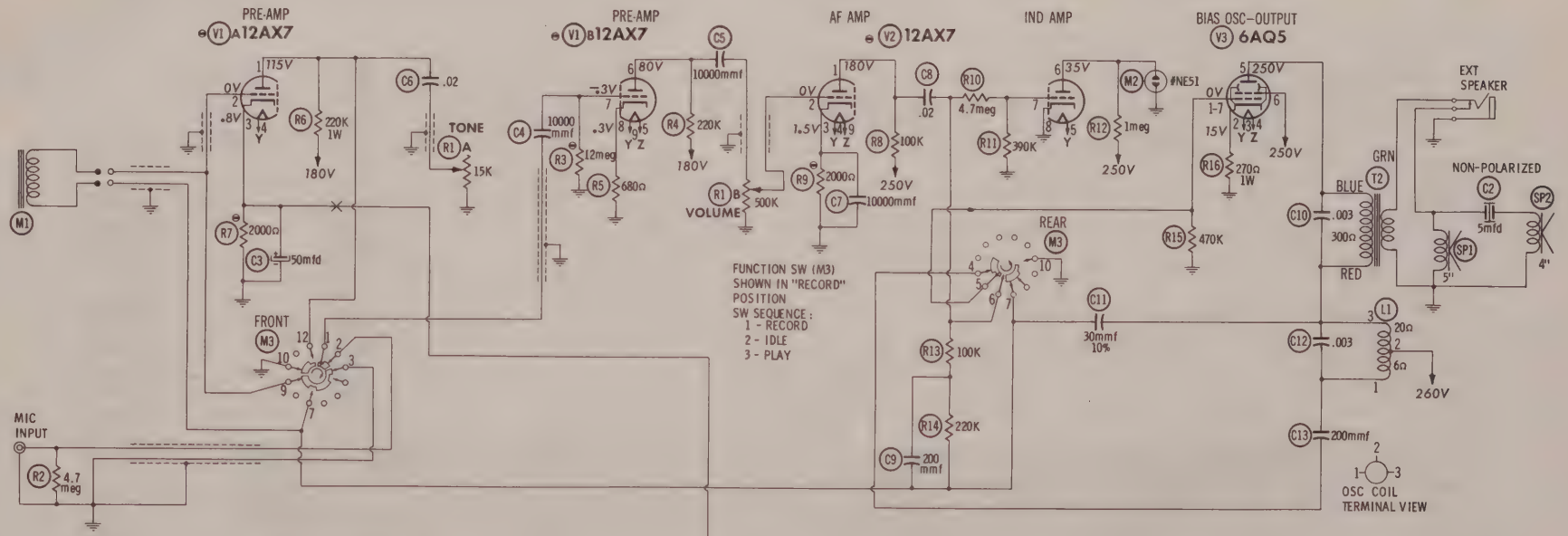


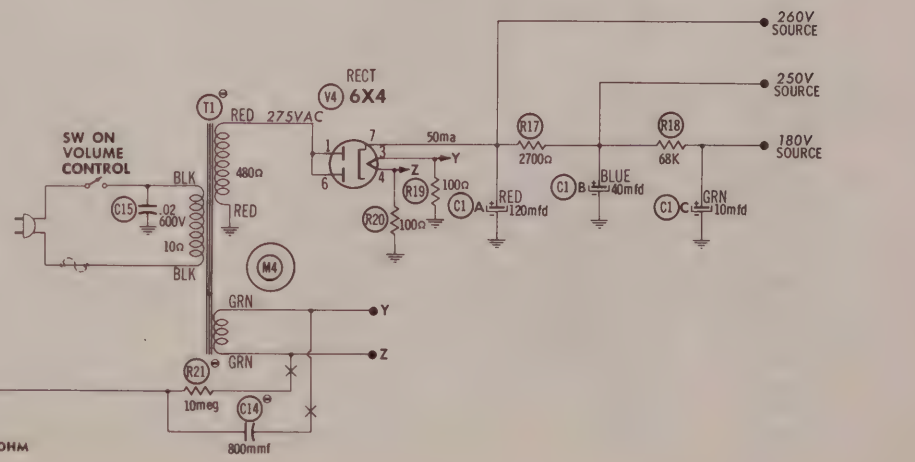
AMPLIFIER CHASSIS BOTTOM VIEW

MODEL 1970

TELECTRO

FOLDER 12





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	† 290K	0Ω	2000Ω	52Ω	52Ω	† 290K	12meg	680Ω	52Ω
V2	12AX7 ECC83	† 100K	0Ω	2000Ω	52Ω	52Ω	† 1meg	390K	0Ω	52Ω
V3	6AQ5	170K	270Ω	52Ω	52Ω	† 320Ω	† 2700Ω	170K		
V4	6X4	480Ω	NC	52Ω	52Ω	NC	480Ω	¶		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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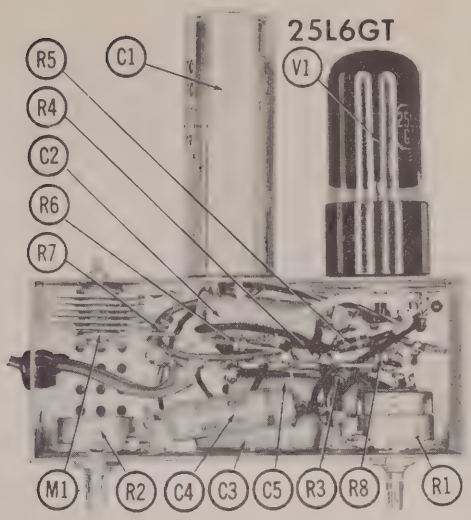
TELECTRO MODEL 1970

PHOTOFACT* Folder

TRAV-LER MODELS 7055, 7057, 7060, 7061, 7062, 7073

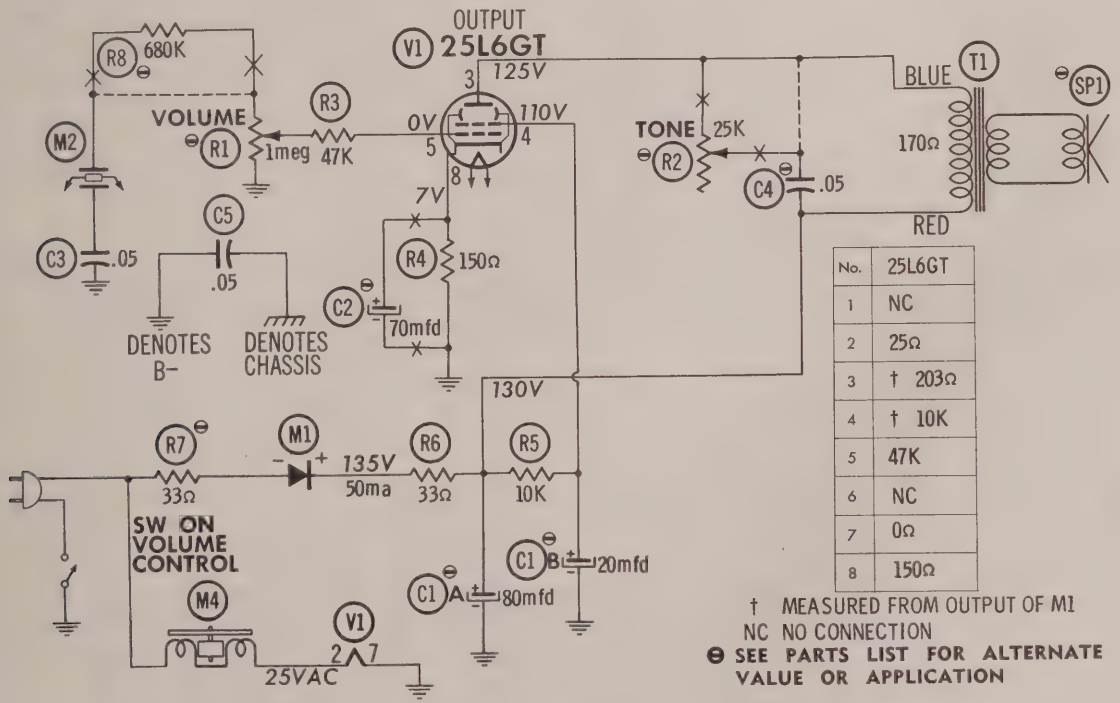
TRAV-LER MODELS 7055, 7057, 7060, 7061, 7062, 7073

MODEL 7073



TRADE NAME	Trav-Ler Models 7055, 7057, 7060, 7061, 7062, 7073
MANUFACTURER	Trav-Ler Radio & Tel. Corp., 571 W. Jackson Blvd., Chicago, Illinois
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player (Models 7055 and 7062 Have 3 Speed Automatic Record Changers)
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .39 Amp. @117 Volts AC (40 Watts) Less Motor

FOR SERVICE INFORMATION ON RECORD CHANGER RC-11 USED IN MODEL 7055--SEE SIMILAR V-M 950--PHOTOFACT SET 216 FOLDER 11 OR RECORD CHANGER MANUAL CM-5.
FOR SERVICE INFORMATION ON RECORD CHANGER RC-17 USED IN MODEL 7062 -- SEE SIMILAR V-M 1200--PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7.



No.	25L6GT
1	NC
2	25Ω
3	† 203Ω
4	† 10K
5	47K
6	NC
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H761

SET 427 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	EC-38 ①	PRS150V8020	BBRT53215		TDLT-4	FMT-315	R2504 *
B	20	150							
C2	70	15	EC-6 ②	PRS150V80	BBR100-15	TC492	TD-80-150	MTD-304	TE-1161

① Models 7055 & 7057 Use Part #EC-26
② Not Used in Model 7060
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.05	400	PC-5	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C4	.05	400	PC-5	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	①
C5	.05	400	PC-5	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

① Model 7060 uses .01mfd in this application (Part #PC-7).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	VC-70 ①	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1orKR-1*	SWE-12	76-1	US-26	
R2A	25K	½	VC-71 ②	B-26	A47-25K-S	Q11-120	U29	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.
① Part # VC-9 is used in models 7057 and 7055.
② Not used in model 7060. Part #VC-42 is used in models 7057 and 7055.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TRAV-LER PART No.	NOTES
R3	47K		IR-10	
R4	150Ω		IR-14	
R5	10K		IR-37	

ITEM No.	RATING OHMS	RATING WATT	TRAV-LER PART No.	NOTES
R6	33Ω		IR-17	
R7	33Ω		IR-17	①
R8	680K			②

① Models 7062, 7055, 7057, 7060 and 7061 uses 47Ω in this application.
② Not used in some versions. (Part #IR-41)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2450Ω	3-4Ω	Part of SP1	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRAV-LER PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	SPK-22 ①	4A07	① Includes T1. Part #SPK-23 used in model 7061, SPK-24 used in models 7055, 7057, 7062.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA TRAV-LER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.047A	SR-2	1234AH	RS075 SD-92 ①	65 K200 ①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA TRAV-LER PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2	PU-22 ①	420-TB-TS	N8-1 &			Model 7073
		KR-314-T①	N8-3			
	PU-13 ①	16	N4-2(J)			Model 7057
	PU-15 ①	66-TY	K-J & K-78-J			Model 7061
		66-1 or 414-1	K-J N8-1			Model 7055
		420-TS	N8-1 & N8-3			Model 7062
	PU-14 ①	28	N4-2(J)			Model 7060

① Includes tone arm and cartridge.
ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA TRAV-LER PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3	(78) PU-22 ①	† VA29 ♦ VA29D	† W-61S	
	(LP)	† VA29LP ♦ VA29LPD	† W-61MGS or † W-61AGS	Model 7073
	PU-13 ①	* J-152 or † J-252 or ♦ J-252D	* WA-400-2 or † WS-400-2	Model 7057
	(78) PU-15 ①	* W-39A or † W-39S or ♦ W-39D	* A-76 or † A-67 or ♦ A-67D	Model 7061
	(LP)	* W-39MGA or † W-39MGS or ♦ W-39MGD	* A-76LP or † A-67LP or ♦ A-67LPD	
		* A-70 or * A-70LP or * A-702	* W-25A or * W-25MGA or * W-25AGA	Model 7055
	(78)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	Model 7062
	(LP)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS or ♦ W-64 MGD	
	PU-14 ①	* J-152 or † J-252 or ♦ J-252D	* WA-400-2 or † WS-400-2	Model 7060

* Metal † Jewel ♦ Diamond ① Includes tone arm and cartridge.

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M4	Phono Motor	M-15	Model 7073
	Phono Motor	M-10	Model 7057
	Phono Motor	M-12	Model 7060, 7061

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRUETONE MODEL DC3800

TRUETONE
MODEL DC3800

TRUETONE
MODEL DC3800

TRADE NAME	Truetone Model DC3800
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 7.5Volts "A" Supply & 67.5 Volts "B" Supply .17 Amp. @ 117 Volts AC (or) 65MA @ 7.5 Volts DC & 11.8MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535 - 1630KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug (front section of tuning gang. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	1630KC	"	"	A5	"
3.	"	"	535KC	Tuning gang fully closed	"	A6	Adjust for maximum deflection. Repeat steps 2 & 3.
4.		Loop	1400KC	Tune to 1400KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H613

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	

ITEM No.	USE	TYPE	NOTES
V3	Det.-AVC-AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■60	150	EC-59						R2689 *
B	▲60	150							
C	100	25							

*Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	220		CC-57	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C3	.047	200	PC-2	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C4	10000		CC-58	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C5	.1	200	PC-3	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C6	1000		CC-37						10%
C7	.1	400	PC-8	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C8	2000		CC-59						10%
C9	.047	400	PC-21	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.1	400	PC-8	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	VC-87	B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-2 or KR-2*	SWE-20	76-2	US-27	

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

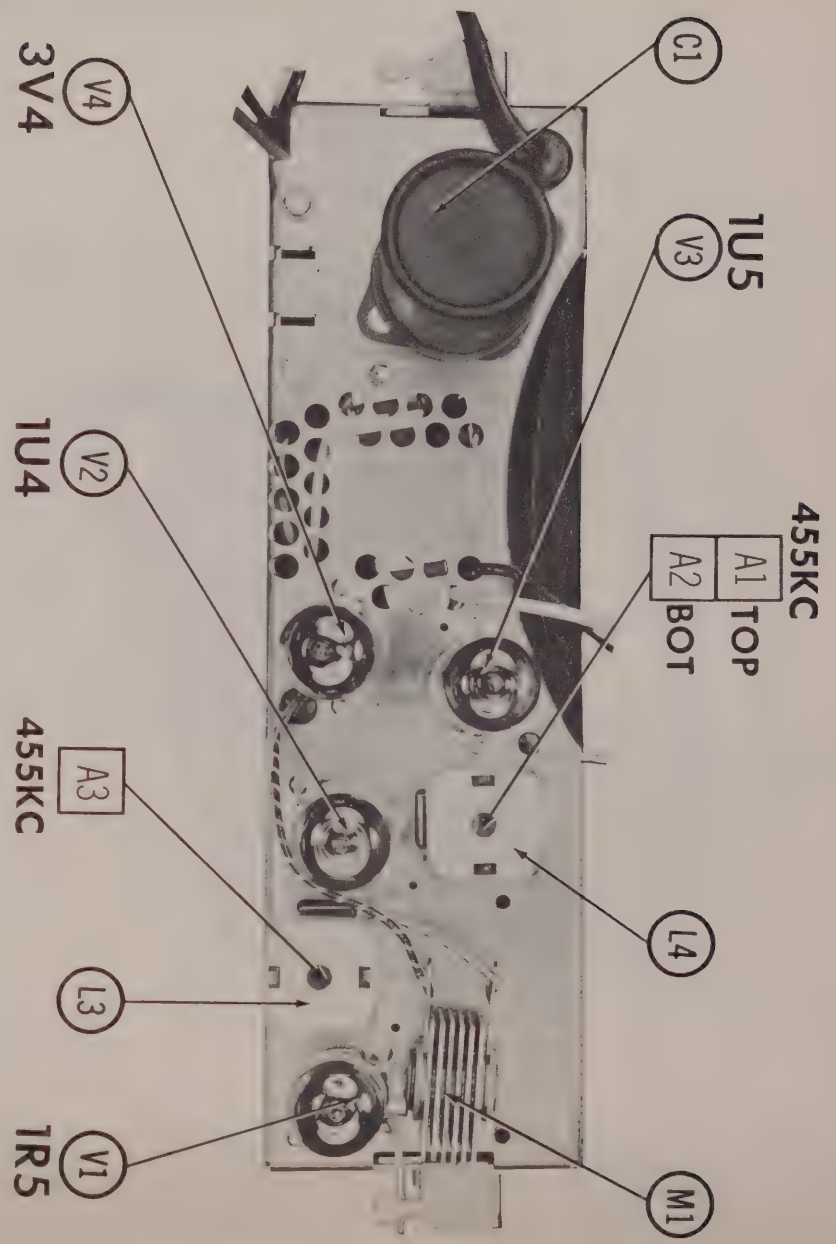
ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R2	1meg		IR-105	
R3	4700Ω		IR-48	
R4	100K		IR-43	
R5	10meg		IR-151	
R6	3.3meg		IR-106	
R7	270K		IR-150	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R8A	750Ω	10(WW)		
B	1500Ω	10(WW)	WR-29	
R9	75Ω	2(WW)	WR-30	
R10	680Ω 5%		IR-149	
R11	150Ω		IR-148	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	LL-45					
L2	Osc. Coil	LO-24		BC-393	69-OSC		
L3	Input IF	LI-15	16-6758	BC-352	12-C7	RF-1	
L4	Output IF	LI-16	"				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8000Ω	3-4Ω	AT-21	Z1110	A-2998		A-3329	24S82	S-8X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SPK-51	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Audio Couplate	150mmf, 150mmf, 2000mmf, 5000mmf, 10000mmf, 1meg, 3.3meg, 4.7meg, 10meg	MC-18	Aerovox PA-521 Centralab PC-165 Sprague DP-1

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	TRUETONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.058A	SR-2	1234AH	RS075	75 ①	① Silicon type K200

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M2 M3	7.5V 67.5V	3B6160 3B6257	C5	P45	717	477	M9	M-211P	

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuning Cap.	GC-21	2 Gang (Ant. 31-367mmf, Osc. 10-100mmf)
M5	Switch	SW-23	Power Changeover, 3 Pole, 2 Position, Rotary Wafer Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

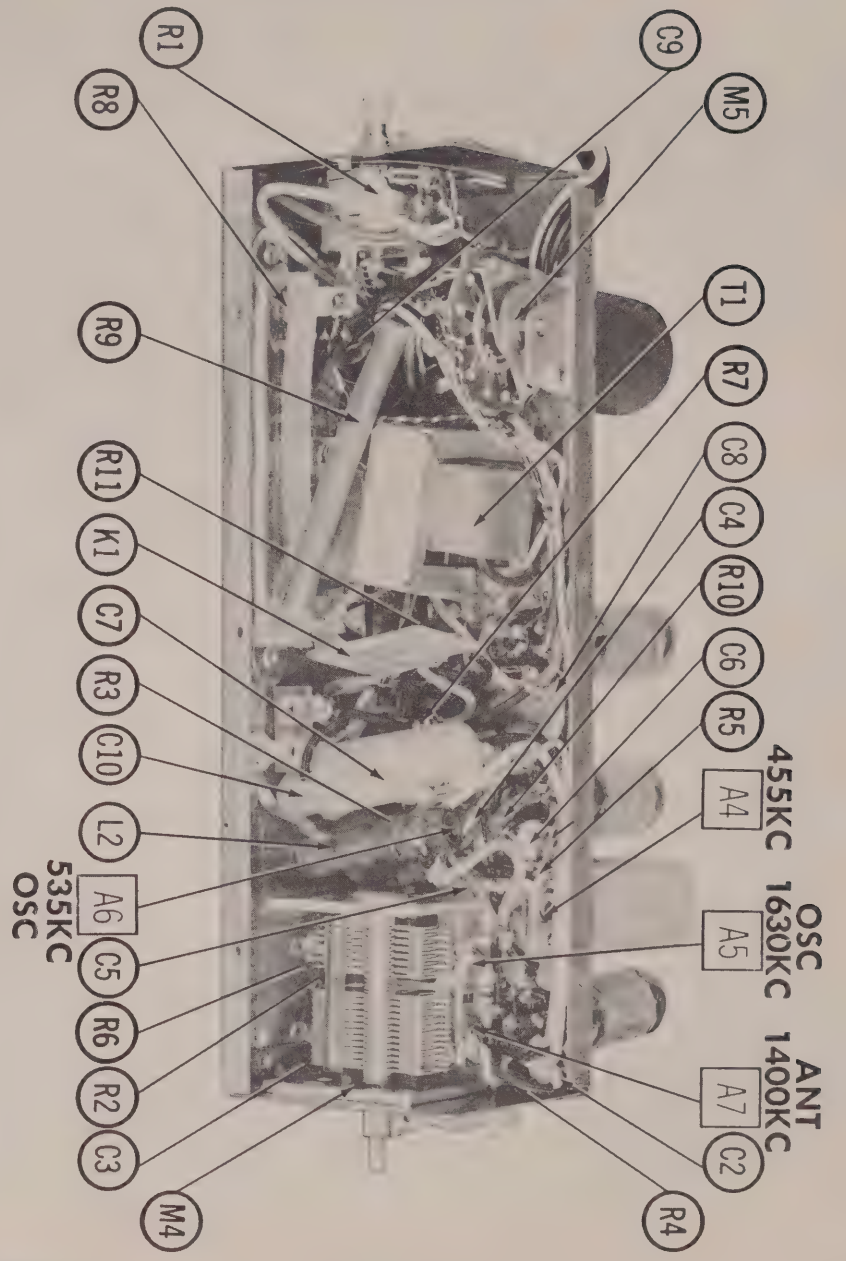
NAME	PART NO.	DESCRIPTION
Knob	K-208	Tuning
Knob	K-209	On-Off-Volume
Cabinet	CA-227	Front and Back

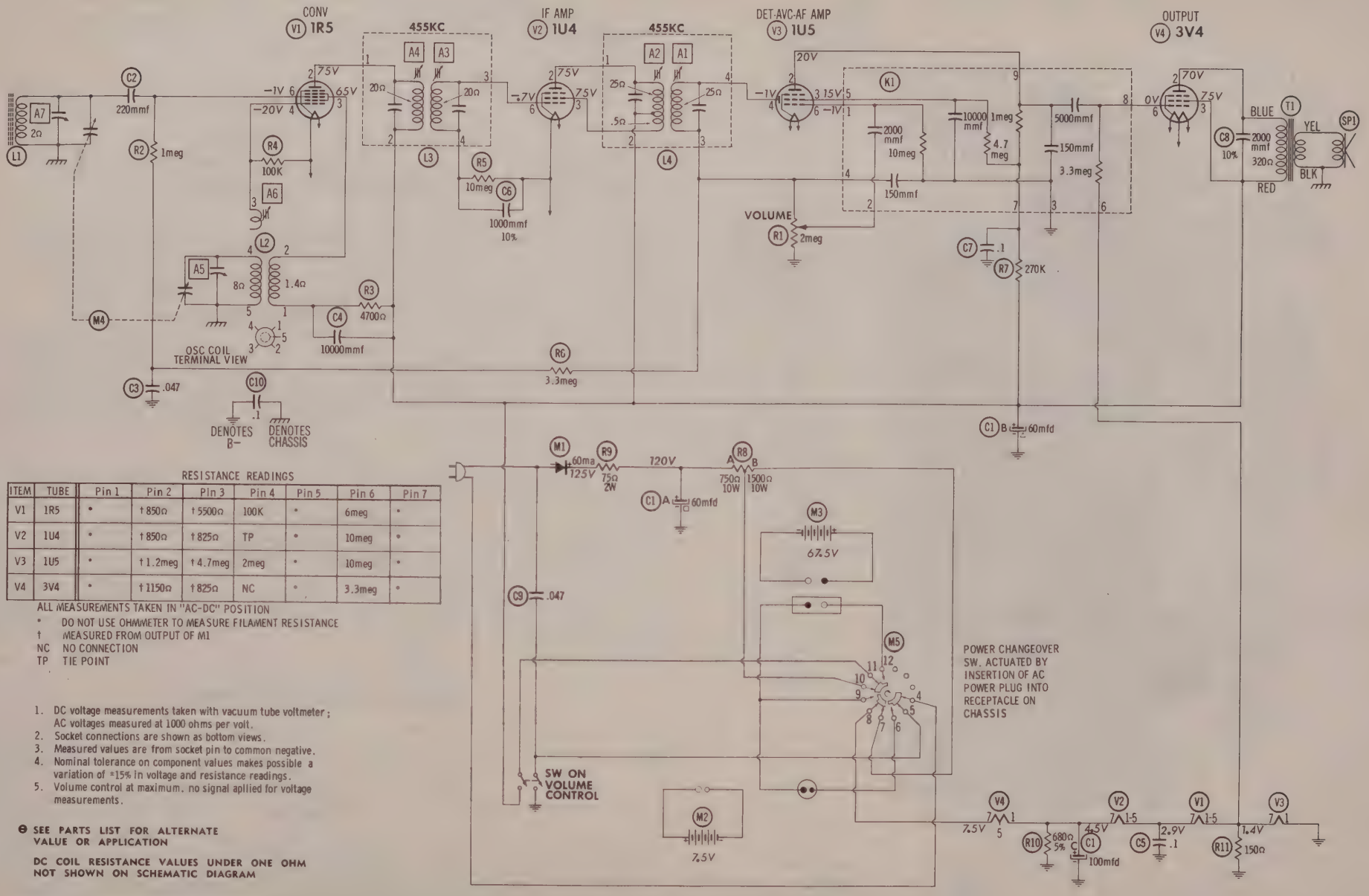
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†850Ω	†5500Ω	100K	•	6meg	•
V2	1U4	•	†850Ω	†825Ω	TP	•	10meg	•
V3	1U5	•	†1.2meg	†4.7meg	2meg	•	10meg	•
V4	3V4	•	†1150Ω	†825Ω	NC	•	3.3meg	•

ALL MEASUREMENTS TAKEN IN "AC-DC" POSITION

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

† MEASURED FROM OUTPUT OF M1

NC NO CONNECTION

TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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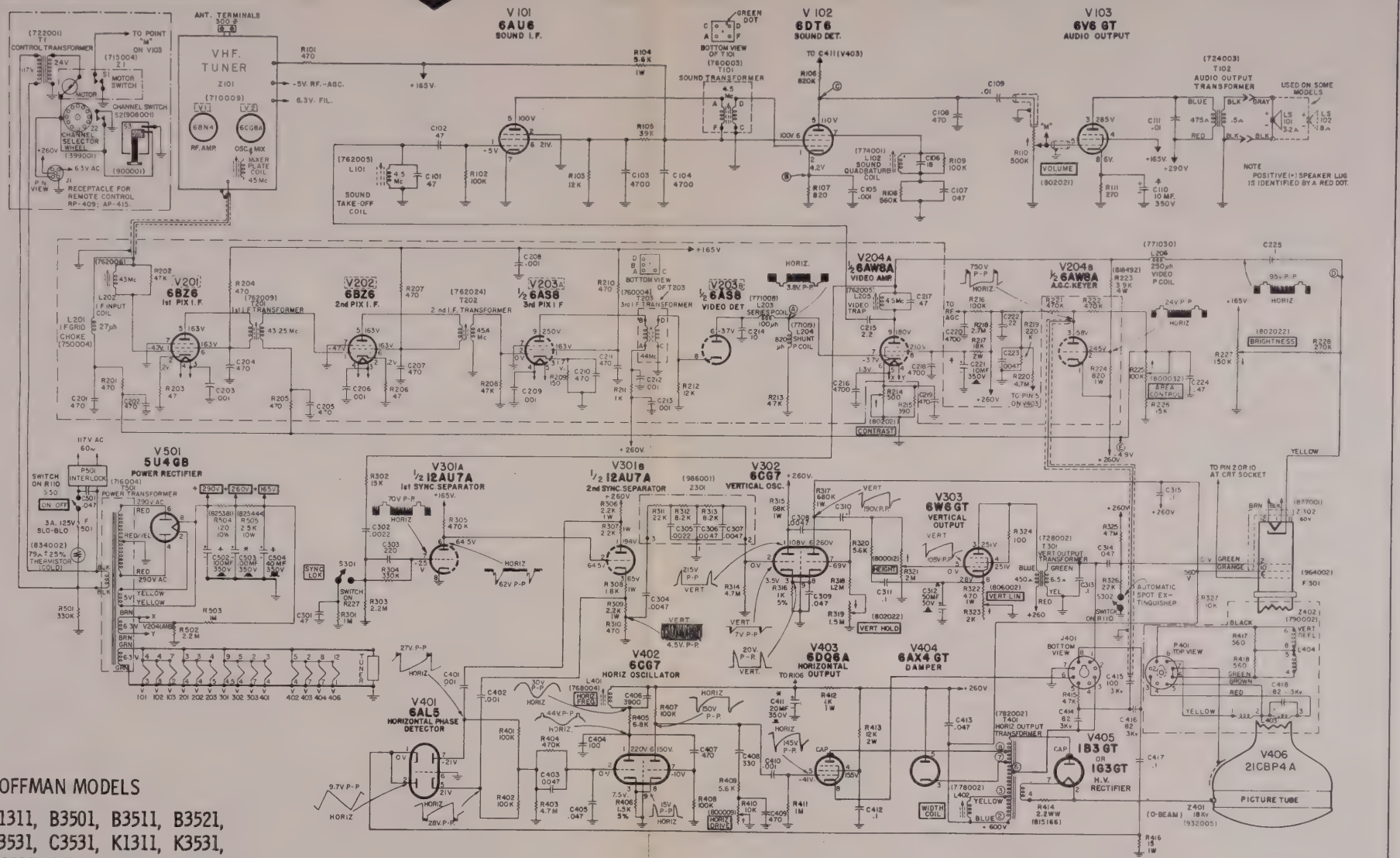

HOFFMAN MODELS

B1311, B3501, B3511, B3521, B3531, C3531, K1311, K3531, M1311, M3501, M3511, M3521, M3531, SP3501, SP3531, W3501, W3511, W3521, W3531, (Ch. 339, 341)

Schematic Diagram Courtesy of HOFFMAN ELECTRONICS Corp.

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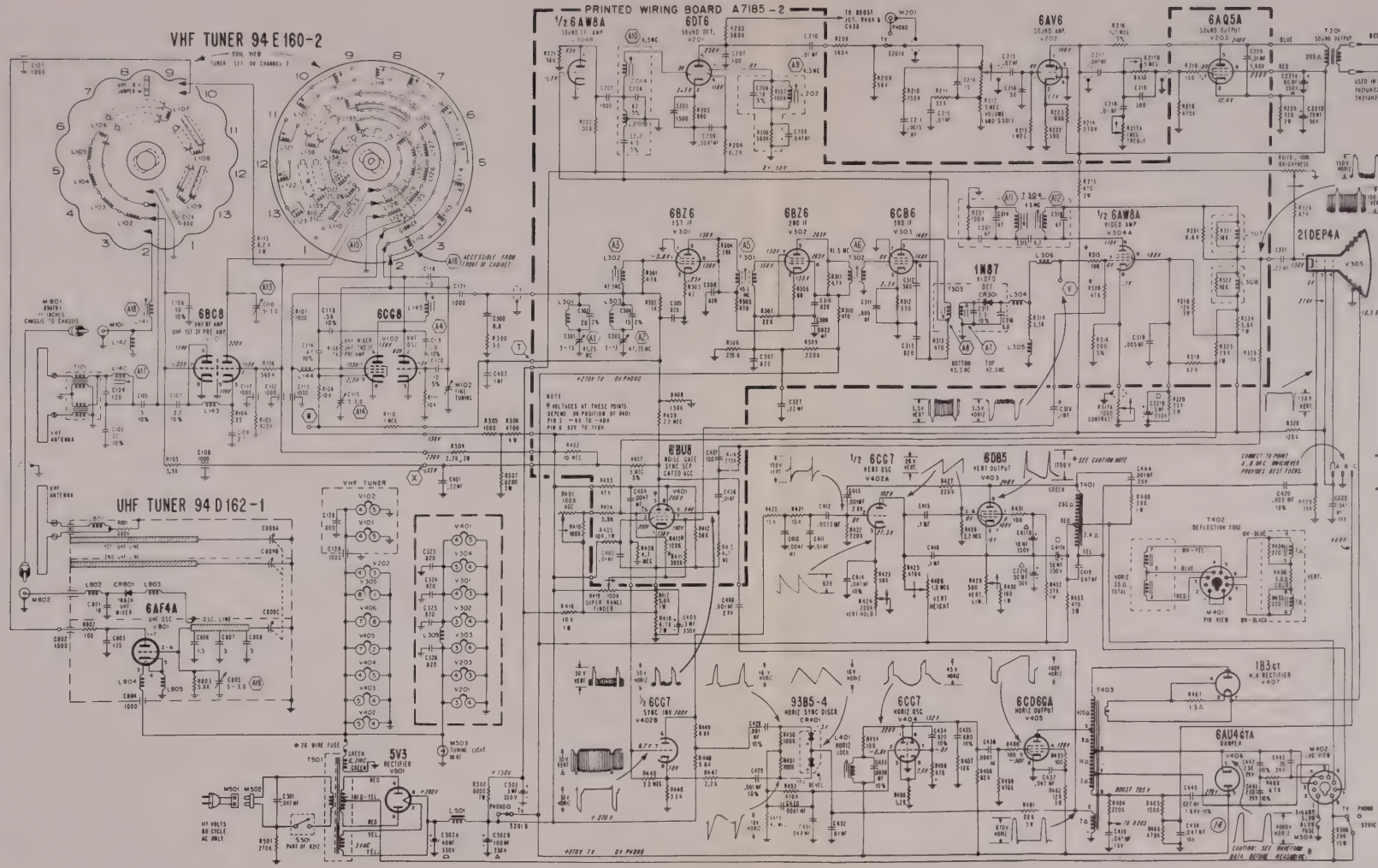

ADMIRAL (Ch. 20B6C, T, 20UB6C, T)

Schematic Diagram Courtesy of ADMIRAL Corp.

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

V-M MODELS
710A, 711A, 714, 750A

V-M MODELS
710A, 711A, 714, 750A

V-M MODELS
710A, 711A, 714, 750A

GENERAL INFORMATION

V-M Tape-O-Matic Models 710A, 711A, 714, and 750A are similar in basic design and construction. All are twin track, two-speed recorders, operating at either 3 3/4 or 7 1/2 inches per second.

Models 710A, 711A, and 714 are housed in portable cases. Model 750A is a cabinet model.

Model 710A is equipped with a combination play-record head and a separate erase head. It is for "Monaural" use only. Model 711A has a combination play-record head, a "Binaural" playback head, and a separate erase head. It can be used to make and play back "Monaural" recordings and also to play "Stereophonic" tapes (staggered type). Models 714 and 750A are equipped with a combination play-record head, a "Stacked Binaural" head, and a separate erase head. They can be used to make and play back "Monaural" recordings and through use of the "Staggered-Stacked" switch will play either "Staggered" or "Stacked" Stereophonic tapes.

Manufactured by:
V-M Corporation
Benton Harbor, Michigan

This material compiled and published by

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C359

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SPECIFICATIONS

VOLTAGE AND POWER REQUIRED:
105-120 volts, 60 cycles AC only. Power consumption — 100 watts.

POWER CORD:
8 feet.

FUSED:
3-amp fuse.

PLAYING TIME:
2 channels at 3 3/4 ips, 2 hours; at 7 1/2 ips, 1 hour with 7-inch reels.

MICROPHONE:
Extended fidelity 50-12,000 cps, high-impedance crystal. 8-foot cable and shielded phone plug.

AMPLIFIER TUBE COMPLEMENT:
Model 710A: 2-12AX7, 6V6GT, 12AU7, 5Y3GT, and 6E5. Models 711A, 714, and 750A: 3-12AX7, 6V6GT, 12AU7, 5Y3GT, and 6E5.

POWER OUTPUT:
10 watts. Less than 3% distortion at 3 db below rated output. Impedance: 8 ohms. Damping factor: *12.

FREQUENCY RESPONSE:
Amplifier: 20-25,000 cps ±1db. Play-Record: 30-18,000 cps ±3db at 7 1/2 ips. 30-11,000 cps ±3 db at 3 3/4 ips.

TONE:
+ 17 db at 50 cps (disabled in record). Flat — full clockwise.

BRILLIANCE:
+ 15 db at 12 kc (variable crossover). Flat — full counterclockwise.

RECORD BIAS AND POWER ERASE:
75 kc.

WOW AND FLUTTER:
Less than .4% rms.

SIGNAL-TO-NOISE RATIO:
Better than -50 db.

CONTROLS

5 safety interlocked buttons for STOP (and STORAGE), RECORD, PLAY, fast FORWARD, and fast REWIND; separate bass and treble controls (TONE and BRILLIANCE), VOLUME control; STACKED-STAGGERED switch (Models 714 and 750A only); instant PAUSE control with standby lock; MONITOR switch; precision tape index TIMER; automatic shut-off; HUM BALANCE control — channel 1 (concealed), HUM BALANCE control — channel 2 (concealed), (not used on Model 710A); EYE SENSITIVITY control (concealed); record BIAS control (concealed).

SPEAKERS

Models 710A, 711A, and 714: One 6x9" woofer with 2.5 oz. Alnico V magnet, one 3 1/2" tweeter with 1.5 oz. Alnico V magnet.

Model 750A: Two 8" woofers with 2.5 oz. Alnico V magnet, one 3 1/2" tweeter with 1.5 oz. Alnico V magnet.

INPUT JACKS (TWO)

MICROPHONE-RADIO-PHONO (dual position). Microphone input sensitivity for full record level, .002 volt. Radio input sensitivity for full record level, .08 volt.

MAGNETIC PHONO, equalized for RIAA curve. Input sensitivity for full record level, .002 volt @ 1 kc.

OUTPUT JACKS (TWO)

EXTERNAL AMP. Constant 1 volt output at 10,000 ohms from normal tape level. EXTERNAL SPKR. (dual position). 8 to 16 ohms impedance for single or multiple speakers (may also be used to drive a 600-ohm line; no load necessary) up to 8 volts output at less than 1% distortion.

STEREO AMPLIFIER EXTERNAL OUTLET (Models 711A, 714, and 750A only)

Constant 1-volt output at 10,000 ohms impedance from normal tape level.

PUSHBUTTONS

STOP button: Depress before each operation and when machine is not in use.

RECORD BUTTON: Depress to record. The red "S" lever must be held to the right before RECORD Button can be depressed.

PLAY button: Depress to play back. Adjust VOLUME control for desired level, and adjust TONE control for most pleasing reproduction.

REWIND button: Depress for high-speed tape rewind.

FORWARD button: Depress for high-speed forward. Also can be used to skip portions of tape in order to find a desired selection.

RECORD LEVEL INDICATOR

When images in eye tube just come together, recording level is correct. When images overlap at peak passages, overloading occurs and playback is distorted.

TAPE INDEX TIMER

After threading a reel of tape, set the large and small dials of the timer to zero. After each selection is recorded, note the timer readings for future reference. In this way, the timer can be used to locate a prerecorded selection.

SPEED CONTROL BUTTON

The speed control button points to the speed (inches per second) at which tape passes the heads. To change speed, turn the speed control button with a coin. Speed is all-important in the quality of recording-reproduction. Generally, the higher the speed, the greater the fidelity.

SAFETY LEVER

The safety lever locks the RECORD button to prevent accidental erasing. Push "S" lever to the right and hold while depressing the RECORD button.

PAUSE BUTTON

To stop the tape while recording or playing, move PAUSE button toward rear of unit. To lock PAUSE button, push toward rear of unit and move to the right. The PAUSE button allows the recording volume to be adjusted before tape starts moving, for noiseless momentary stops, to eliminate commercials, lulls in conversation, etc.

MONITOR SWITCH

This switch is used should you desire to listen to a recording while it is being made. Leave switch in "On" position if unit is to be used as phonograph amplifier or public address system.

AUTOMATIC SHUT-OFF SWITCH

The mechanism is automatically shut off unless tape is threaded in front of plastic shutoff lever. Should tape break or supply reel become empty, mechanism and amplifier will shut off automatically and remain shut off until machine is rethreaded.

OPERATING INSTRUCTIONS

How To Thread Tape

With STOP button depressed, place empty reel on right-hand spindle. Place a full reel on left-hand spindle. Thread tape (glossy side out), following threading line (embossed in plastic escutcheon), straight through slot in covers and in front of automatic shutoff lever. See Fig. 1. Place tape in front of chrome-plated tape guide and insert free end of tape into hub slot of right-hand reel. Wind right-hand reel one or two turns counterclockwise to take up slack between reels.

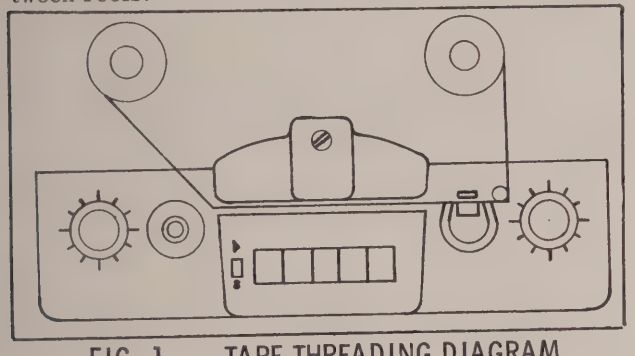


FIG. 1 TAPE THREADING DIAGRAM

How To Record

1. Insert line cord into a 105-120-volt, 60-cycle AC outlet and connect microphone or other type of input.

2. Switch on recorder by turning TONE control clockwise.

3. Push PAUSE button toward rear of unit and move it to the right to lock in position.

4. Hold red safety lever "S" to the right and depress RECORD button.

5. Adjust VOLUME control so eye tube images just come together at loudest sounds.

6. Set TIMER dials to zero. Make a note of the reading at beginning and end of recording on the tape carton.

7. Move PAUSE button to left to start recording.

8. Depress STOP button when recording is completed. Rewind tape by depressing REWIND button. Recorder automatically shuts off when rewinding is completed.

How To Play Recordings

1. Thread tape as described under "How to Thread Tape"

2. Depress PLAY button and adjust VOLUME and TONE controls for desired tonal quality.

HOW TO PLAY STEREOPHONIC TAPES (MODELS 711A, 714, AND 750A)

1. Thread stereophonic tape as described under "How to Thread Tape".

2. Insert shielded cable (supplied with Models 711A, 714, and 750A) into STEREO AMPLIFIER EXTERNAL OUTLET and into input of external amplifier.

3. No hard and fast rule can be made for placing speakers since much depends on room size and acoustical qualities. Generally, speakers should not be placed closer than five nor more than ten feet apart.

4. After switching on both units, depress PLAY button.

5. The external amplifier volume control varies the loudness of the signal picked up by the binaural head. The recorder VOLUME control varies the signal picked up by the play-record head. Adjust volume level so that sounds seem to come from between the speakers.

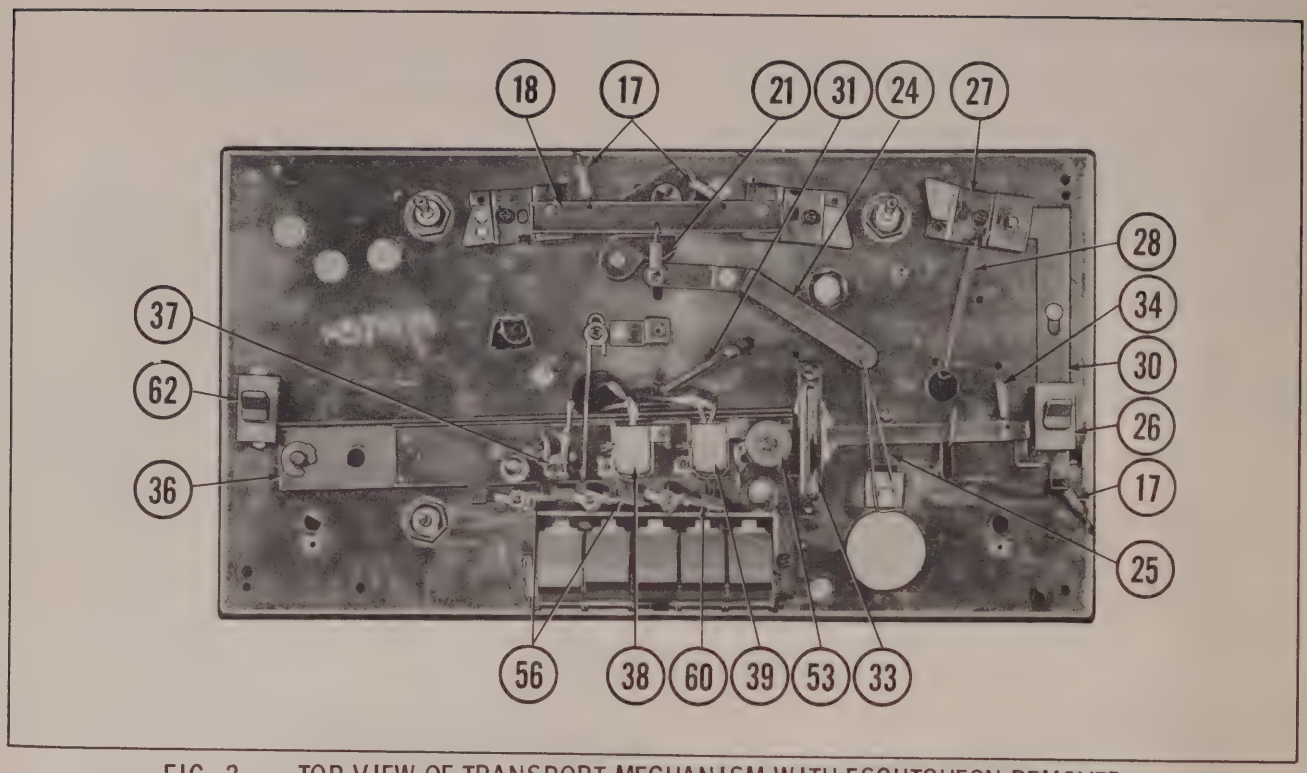


FIG. 2 TOP VIEW OF TRANSPORT MECHANISM WITH ESCUTCHEON REMOVED

MECHANICAL ADJUSTMENTS

Fast Forward Torque Adjustment

Fast forward torque must be 5 to 7 oz., measured 2 3/4" from center of take-up reel. To adjust, insert a 3/8" nut driver through hole provided in baseplate (see Fig. 2). Turn eccentric-mounted tension pulley (123) counterclockwise to increase torque or clockwise to decrease torque. Make sure not to exceed maximum travel of eccentric.

Head Bar Bracket Adjustment

Adjust head bar bracket (33) so head bar (36) moves freely without binding. If bracket is too loose, pressure roller (53) will not press against capstan evenly, causing flutter or the tape to climb.

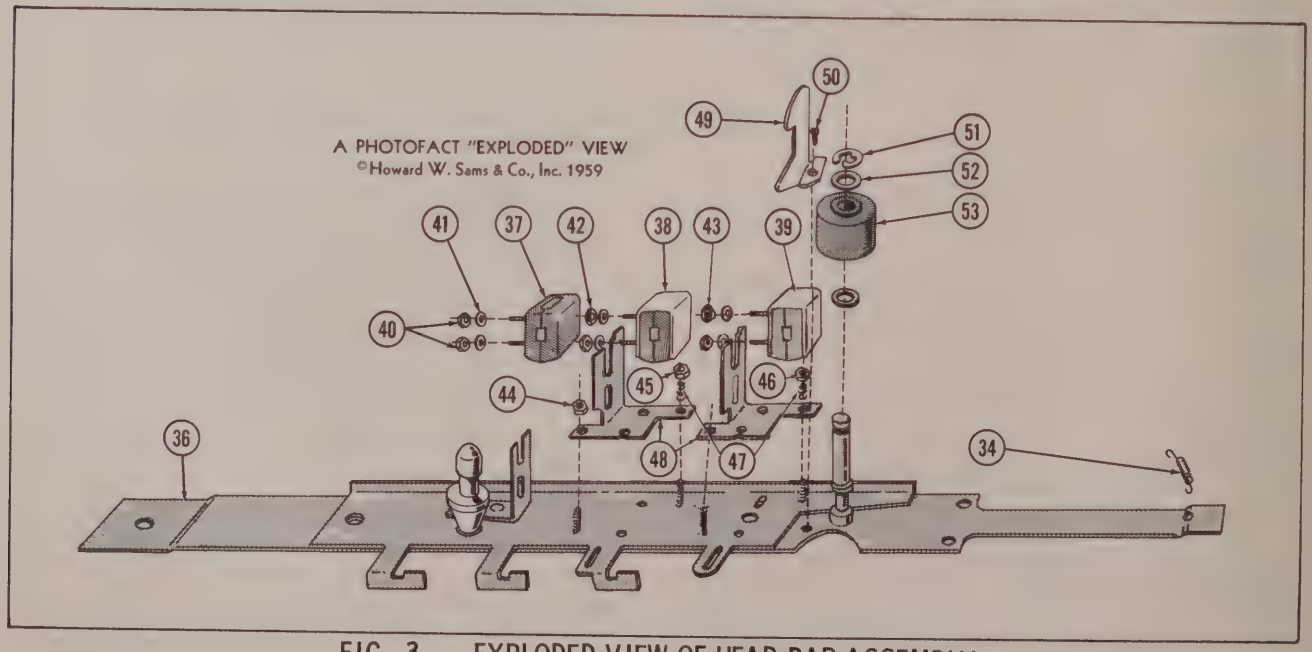


FIG. 3 EXPLODED VIEW OF HEAD BAR ASSEMBLY

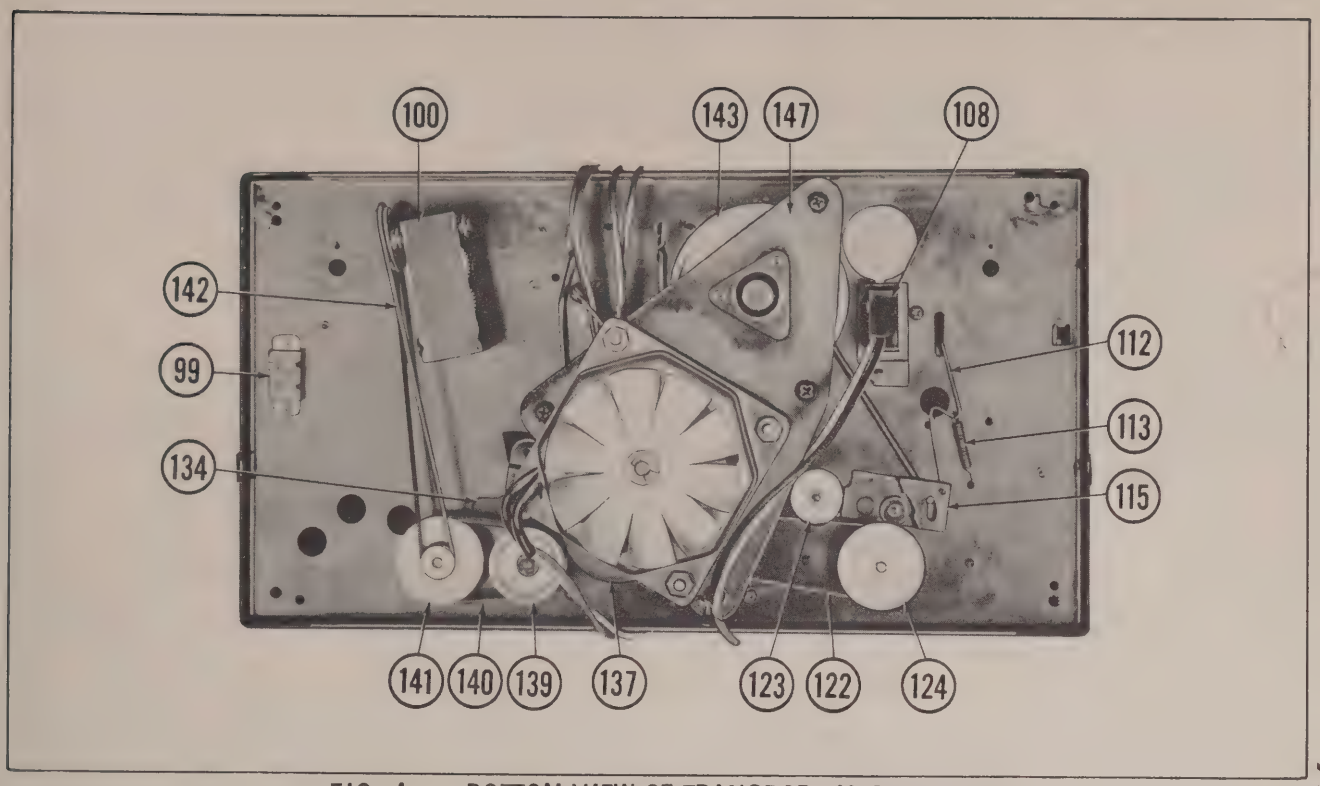


FIG. 4 BOTTOM VIEW OF TRANSPORT MECHANISM

Pressure Roller Pressure Adjustment

Pressure roller pressure against the capstan in "Play" and "Record" position should be 2 1/2 to 3 1/2 lbs. Adjust by bending button levers (88) where head bar activating springs (71 and 73) are hooked. To decrease pressure, bend tab in; to increase pressure, bend tab out.

Play And Record Torque Adjustment

Measured 2 3/4" from center of take-up reel, take-up torque in "Play" and "Record" should be 1 1/2 to 3 oz. With a pair of needle-nosed pliers, bend take-up actuator (112) (at point A in Exploded View), shortening or lengthening to increase or decrease torque respectively.

NOTE: When adjusting pressure roller pressure, play and record torque, or fast forward torque, adjusting one affects the other unless the proper sequence is followed. The sequence is:

1. Fast forward torque.
2. Pressure roller pressure.
3. Play and record torque.

Recheck pressure roller pressure after play and record torque adjustment.

Stop Adjustment

Bend stop button lever (88), where brake activating hook (72) connects, so that brakes release reel discs when any one of the buttons is depressed. When STOP button is depressed, bell crank (127) must disengage capstan idler (120) from motor shaft, flywheel and capstan assembly (143).

Pause Brake Adjustment

With tape on machine and PLAY button depressed, bend tab (point "B" on Exploded View) on pause brake lever so that right-hand reel stops at same time tape drive releases.

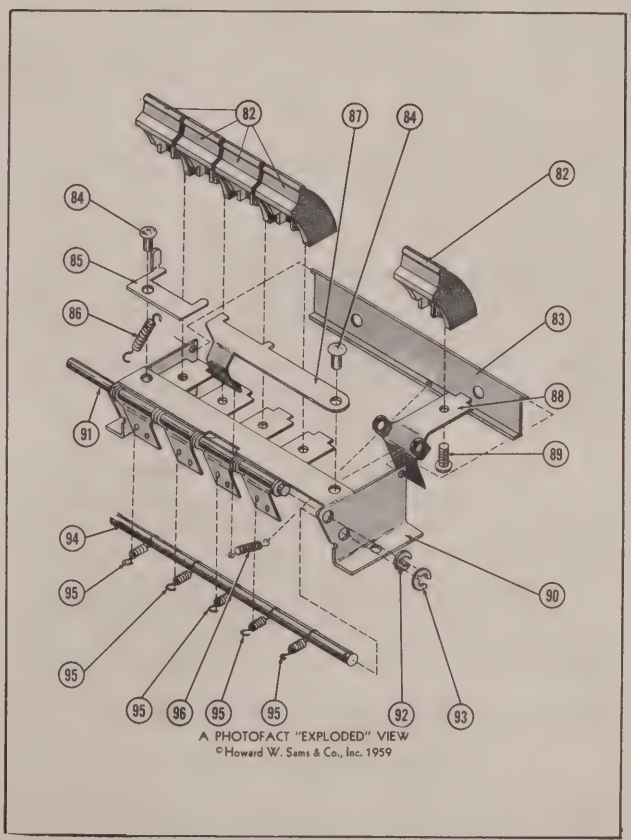


FIG. 5 EXPLODED VIEW OF CONT. BUTTON ASS'Y

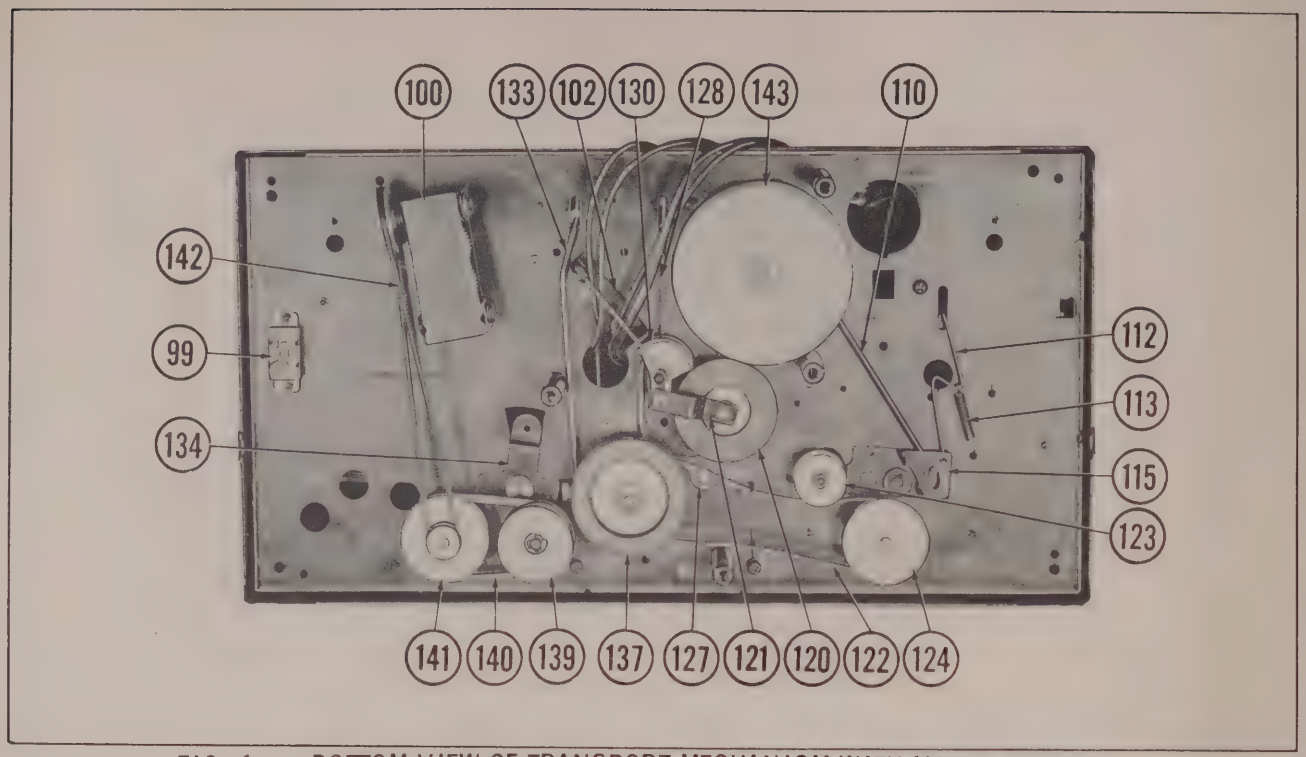


FIG. 6 BOTTOM VIEW OF TRANSPORT MECHANISM WITH MOTOR REMOVED

Pressure Roller Alignment

Pressure roller stud must be parallel with capstan or tape will creep up or down the capstan. Check by removing E ring (51). Slightly raise pressure roller (53) and depress PLAY button. If pressure roller creeps up or down, straighten by slipping a close-fitting sleeve over the stud.

Rewind Torque Adjustment

Measured 2 3/4" from center of rewind reel, rewind torque should be 2 1/2 to 4 1/2 oz. If torque is low, make sure rewind driver (139) is not skidding on take-up driver (137). Remove any oil or grease from drivers and rewind belt (140).

HEAD ALIGNMENT ADJUSTMENTS

All heads must be lined up perfectly with the tape. If they are not, low output, loss of high frequencies, track overlap, or poor erase may result.

Play-Record Head - All Models

1. Head Height: Top edge of play-record head (38) pole pieces must be set evenly with top edge of tape. Thread tape on recorder and adjust by loosening two hex nuts (42) on side of head. After adjusting head height, tighten hex nuts (42), making sure face of head is perpendicular to tape.

2. Azimuth Adjustment: Obtain a standard alignment tape on which a signal of 5,000 cps or higher has been recorded. Connect an output meter or sensitive AC voltmeter to EXTERNAL SPKR. jack. Play back alignment tape and pivot play-record head (38) by turning hex nut (45) until maximum amplitude on meter is achieved. On Models 714 and 750A, the STACKED-STAGGERED switch must be in STAGGERED position.

Binaural Head Adjustment - Model 711A

1. Head Height: Bottom edge of binaural head pole piece must be set evenly with bottom edge of tape. Remove binaural pressure pad arm assembly and thread tape on recorder. Depress PLAY button. With small mirror, observe position of pole piece. Adjust by loosening two hex nuts (43) on side of binaural head (39). After adjusting, tighten hex nuts.

2. Azimuth Adjustment: Turn hex nut (46) and adjust in same manner as play-record head. Connect output meter across STEREO AMPLIFIER EXTERNAL OUTLET.

Binaural Head Adjustment - Models 714 And 750A

1. Head Height: Loosen hex nuts (43) and adjust "In Line" binaural head in same manner as play-record head.

2. Azimuth Adjustment: Turn hex nut (46) and adjust in same manner as play-record head. Connect output meter to STEREO AMPLIFIER EXTERNAL OUTLET or EXTERNAL SPKR. jack. If connecting to EXTERNAL SPKR. jack, place STACKED-STAGGERED switch in STACKED position.

Erase Head Adjustment - All Models

Erase head (37) should be adjusted so that pole piece is approximately .005" above top edge of tape. Although not too critical, the face of erase head and azimuth should be as nearly perpendicular to tape as possible by visual alignment.

HEAD DEMAGNETIZING

Record-playback heads should be demagnetized regularly to remove permanent magnetism.

Magnetized heads will cause loss of high-frequency response when previously recorded tapes are played back, as well as an increase in noise level and distortion in new recordings.

Permanent magnetism is a normal condition developing from overloading the head while recording. Another major cause is working on or around heads using magnetized tools.

CLEANING

Most defects, other than wear or breakage, can be traced to dirty surfaces. Heads (37, 38, and 39), capstan, and pressure roller (53) accumulate tape coating oxide, worn off the tape as it passes these parts. Since this accumulation will cause poor preformance, it should be removed periodically with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen cloth slightly with alcohol.

ELECTRICAL ADJUSTMENTS

Hum Balance Adjustment

Hum balance controls are located at rear of amplifier chassis. They are accessible through storage compartment on all portable models (model 710A has only one hum balance control). On Model 750A, the controls can be adjusted by removing grille from rear of cabinet.

On all stereo playback units, one control for each channel is provided. Control No. 1 is for the main channel amplifier, and control No. 2, the stereo preamplifier.

To adjust, place VOLUME and TONE controls at maximum and set hum balance controls for minimum hum. Try line cord plug both ways.

If hum is still excessive, power transformer may have to be repositioned. In such cases, orient transformer and adjust hum balance control for minimum hum.

Eye Sensitivity Adjustment

The eye sensitivity control should be set to close eye at 1.5 volts at external speaker jack with no load. Adjust by turning TONE control fully clockwise and BRILLIANCE control fully counterclockwise. Turn on MONITOR switch. Connect an audio generator to MICROPHONE input. Set audio generator to .1 volt output at 1,000 cycles. Connect AC voltmeter to EXTERNAL SPKR. jack (insert plug all the way so no load is applied to secondary of output transformer).

With unit in STOP position, adjust VOLUME control for 1.5 volts AC at meter.

Depress RECORD button and adjust eye sensitivity control to close eye. Do not overlap images.

Bias Adjustment

Bias current to play-record head must be set properly to insure proper recording characteristics. Do not attempt to adjust without proper equipment.

Disconnect plain white lead from play-record head and connect a wide-range AC voltmeter between chassis and head pin previously connected to white lead.

Connect a 100-ohm carbon resistor (noninductive) of at least 5% accuracy across meter terminal.

Depress RECORD button and adjust bias adjustment ( ) until voltmeter reads approximately .1 volt. With this voltage reading, current through head is approximately 1 milliamp.

CAUTION: Never adjust the oscillator coil. This is a balanced coil and any adjustment will distort the bias signal.

LUBRICATION

Lubricants applied at time of manufacture are sufficient for a long period of time, but in case parts are replaced, or approximately once a year, lubricate as follows:

Apply SAE No. 5 motor oil to the following:

1. Both capstan bearings. Place one drop on each bearing. Be sure no oil is on that part of capstan extending above baseplate.
2. Tension pulley (123) bearings.
3. Reel disc bearings (101).
4. Rewind driver bearing (139).
5. Capstan idler bearing (120).
6. Take-up driver bearing (137).
7. Pressure roller bearing (53).

NOTE: When oiling any bearing to which a rubber part is mounted, or any part using a belt, apply only one drop of oil.

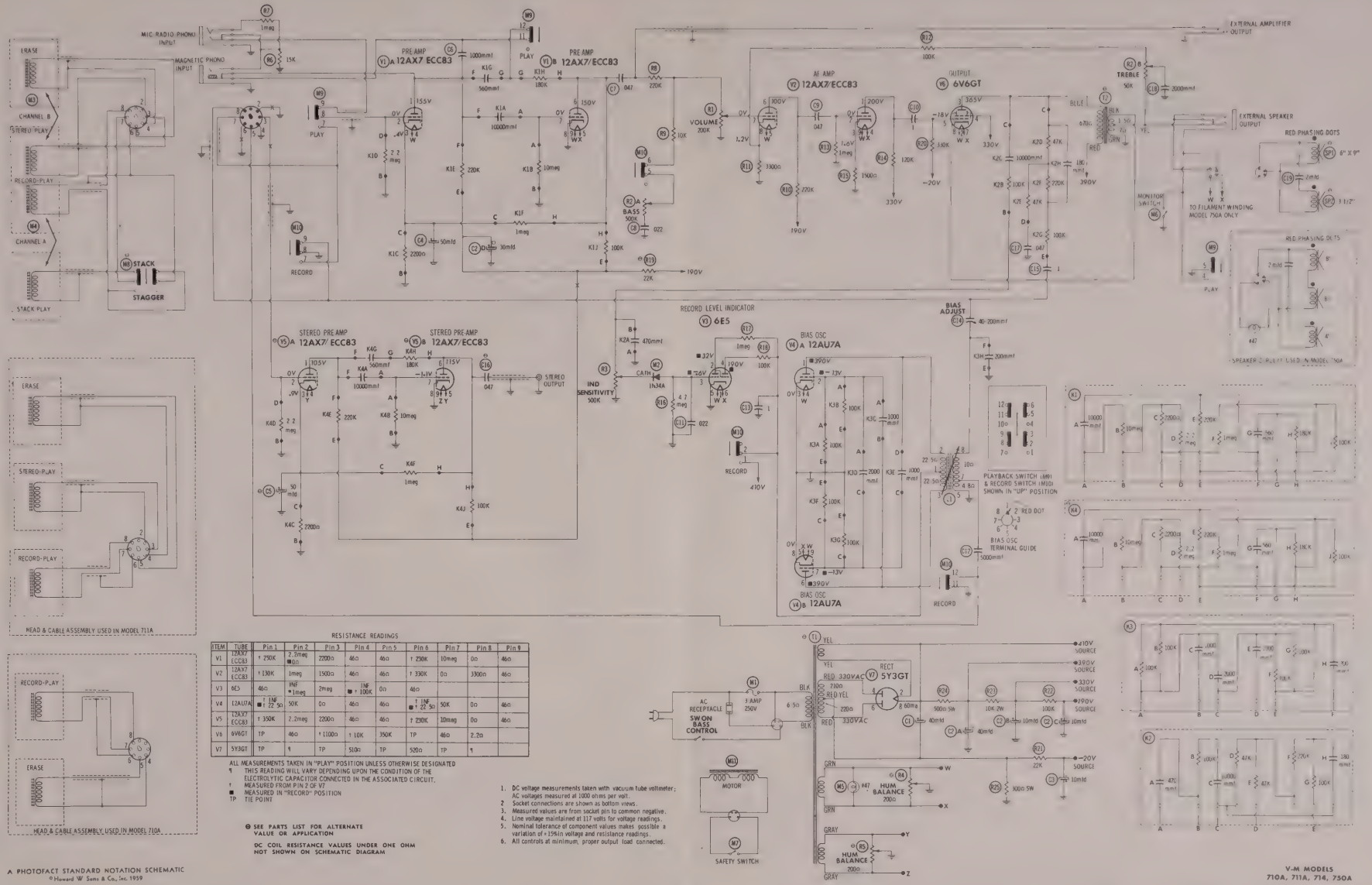
CAUTION: Keep oil and grease away from all rubber idlers, belts, the circumference of the flywheel or any parts that might transfer oil or grease to them.

Apply Trojan H2 grease to the following:

1. Between brake arm (18) and brake shoes.
2. Between brake shoes and baseplate.
3. Between rewind arm (134) and baseplate.
4. Under head bar (36) pivot bosses.
5. Top of head bar (36) above right-hand bosses.
6. Between take-up bar (115) and baseplate.
7. Between pause brake lever (30) and baseplate.
8. Between bell crank (127) and baseplate.
9. Latch bar (83) on cam side where button levers (88) make contact.
10. Latch bar (83) and button housing (90) pivot holes.
11. Brake rod ends (128) at baseplate hole.
12. Rewind rod (133) at baseplate hole.
13. Fast forward rod (110) at take-up bar (115) slot.
14. Holes in baseplate where amplifier switch extensions slide.

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Take-up Reel does not revolve in play or record position.	1. Pause Brake on, or sticking.	1. Release pause brake, check that pause brake lever (30) is free and releases completely.
	2. Brakes (18) not releasing properly.	2. Check that brakes (18) are releasing completely, if not, adjust button lever (88) on stop button.
	3. Take-up belt (122) worn.	3. Replace worn or stretched belt.
	4. Take-up belt (122) off pulleys.	4. Pulleys must be aligned correctly or belt will continue to slip off.
	5. Capstan idler (120) not engaging flywheel.	5. Check that speed change button is in detent completely; also check that bell crank (127) is releasing the capstan idler (120).
	6. Speed cnange not in detent completely.	6. Turn button to proper speed.
	7. Tension pulley (123) not engaging take-up belt.	7. Check that take up arm (115) is not binding on baseplate, or take up rod (110).
	8. Pressure roller (53) applying too much pressure against capstan, stalling motor.	8. Adjust button lever (88) on play and/or record buttons so the pressure roller applies from 2 1/2 to 3 1/2 lbs. pressure on the capstan. (See "Mechanical Adjustments").
	9. Tension pulley (123) not adjusted properly.	9. Tension pulley must be adjusted properly. (See "Mechanical Adjustments").
	10. Head bar activating springs (71 or 73) off or broken.	10. Replace.
	11. Take-up bar actuator not adjusted properly.	11. See "Mechanical Adjustments".
	12. Take-up driver (137) not engaging motor shaft.	12. Take-up arm (20) must operate freely.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	↑ 250K	2.2meg ■0Ω	2200Ω	46Ω	46Ω	↑ 230K	10meg	0Ω	46Ω
V2	12AX7 ECC83	↑ 130K	1meg	1500Ω	46Ω	46Ω	↑ 330K	0Ω	3300Ω	46Ω
V3	6E5	46Ω	INF ■1meg	2meg	INF ■↑ 100K	0Ω	46Ω			
V4	12AU7A	■↑ INF ↑ 22 SΩ	50K	0Ω	46Ω	46Ω	■↑ INF ↑ 22 SΩ	50K	0Ω	46Ω
V5	12AX7 ECC83	↑ 350K	2.2meg	2200Ω	46Ω	46Ω	↑ 230K	10meg	0Ω	46Ω
V6	6V6GT	TP	46Ω	↑ 1100Ω	↑ 10K	350K	TP	46Ω	2.2Ω	
V7	5Y3GT	TP	¶	TP	510Ω	TP	520Ω	TP	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
↑ MEASURED FROM PIN 2 OF V7
■ MEASURED IN "RECORD" POSITION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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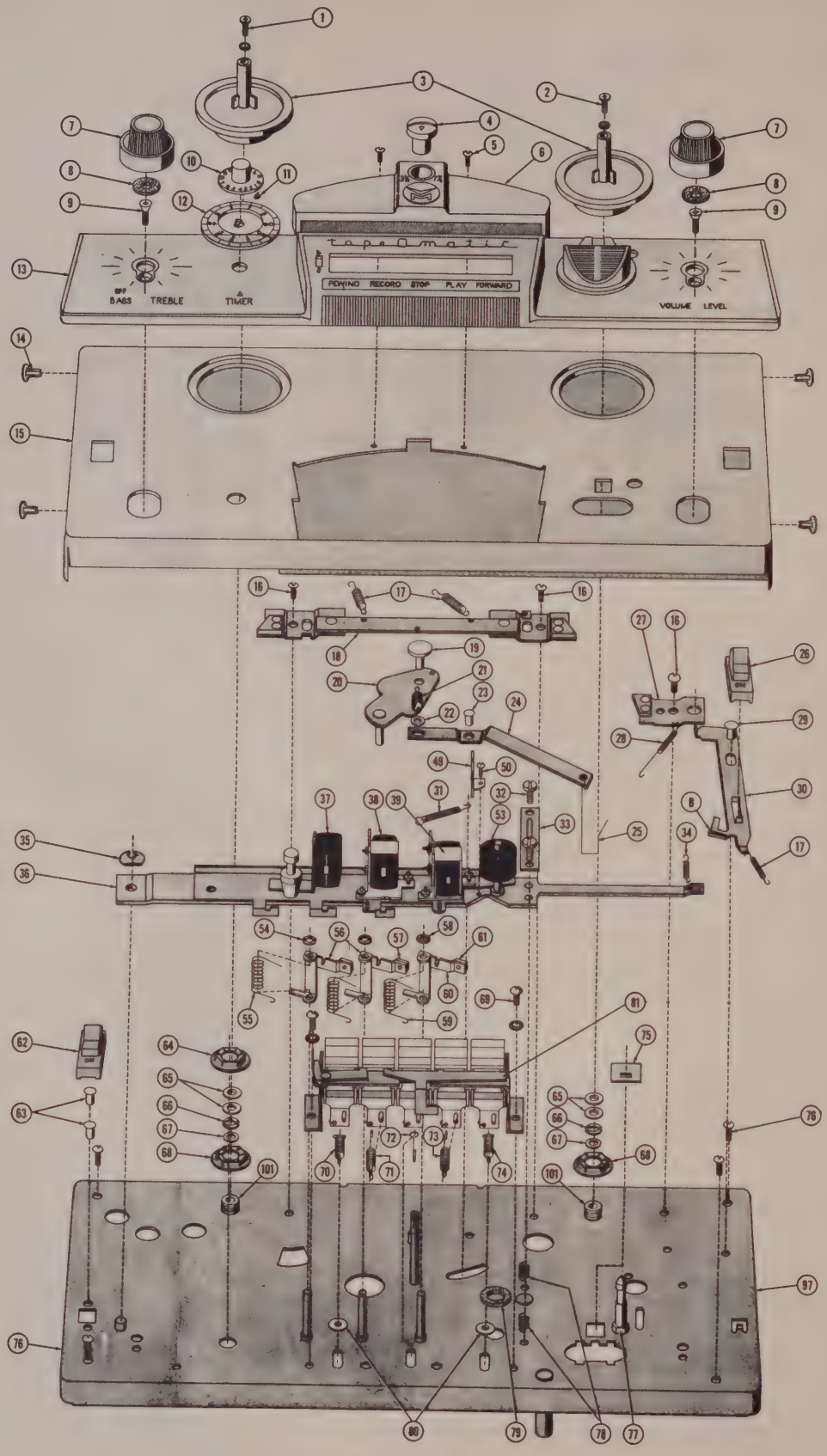
V-M MODELS
710A, 711A, 714, 750A

SYMPTOM	CAUSE	REMEDY
Take-up Reel does not revolve in Forward Position.	1. Button lever (88) not adjusted properly.	1. Button lever can be adjusted to make small deviations in torque (See No. 5).
	2. Activating Spring (21) loose or broken.	2. Replace.
	3. Take-up belt (122) off pulleys.	3. Replace. (See "Take-up Reel does not revolve in Play or Record position").
	4. Take-up belt (122) worn.	4. Replace.
	5. Tension pulley (123) not adjusted properly.	5. In forward position, tension pulley should be adjusted so there is 5 to 7 ozs. of torque approximately 2 3/4 in. from the center of the reel. See "Mechanical Adjustments".
	6. Brake sticking on supply reel disc.	6. Check that brake return springs are releasing brakes.
	7. Too much friction in counter (100).	7. Counter should turn freely without binding.
	8. Motor stalling.	8. Check that tension pulley (123) is adjusted properly. (See No. 5).
	9. Tension pulley (123) not engaging take-up belt.	9. Check that take-up arm (115) is not binding on baseplate or take-up rod (110).
Reels do not stop when stop button is depressed.	1. Button lever (88) not adjusted properly.	1. Button lever must be adjusted to release the brakes completely when another button is pushed.
	2. Brake activating hook (72) or spring (21) loose or broken.	2. Replace.
	3. Brake Assembly binding.	3. Check to see if brake assembly operates freely.
	4. Tension pulley not adjusted properly.	4. (See "Take-up Reel does not revolve in Forward Position").
	5. Brakes worn.	5. Replace brake assembly (18).
	6. Take up arm (115) sticking.	6. Take-up arm must operate freely.
Weak Output (Mech.).	1. Playback Head (38) not aligned properly.	1. Head should be aligned for maximum output. See "Head Alignment Adjustments".
	2. Pressure Pad (57) not making proper contact with head.	2. Pressure Pad (57) should make complete contact with head pole piece.
	3. Light pressure pad pressure.	3. Pressure pad must have from 12 to 18 grams pressure on head.
	4. Defective Record Head (38).	4. Replace.
Take-up Reel revolves fast when Play or Record buttons are depressed.	1. Tab on pause brake lever (30) not adjusted properly.	1. Adjust pause brake lever so pressure roller (44) disengages capstan, and take up reel stops simultaneously.
	2. Head bar bracket (33) too tight.	2. See "Mechanical Adjustments".



A PHOTOFACT "EXPLODED" VIEW

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FIG. 7A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

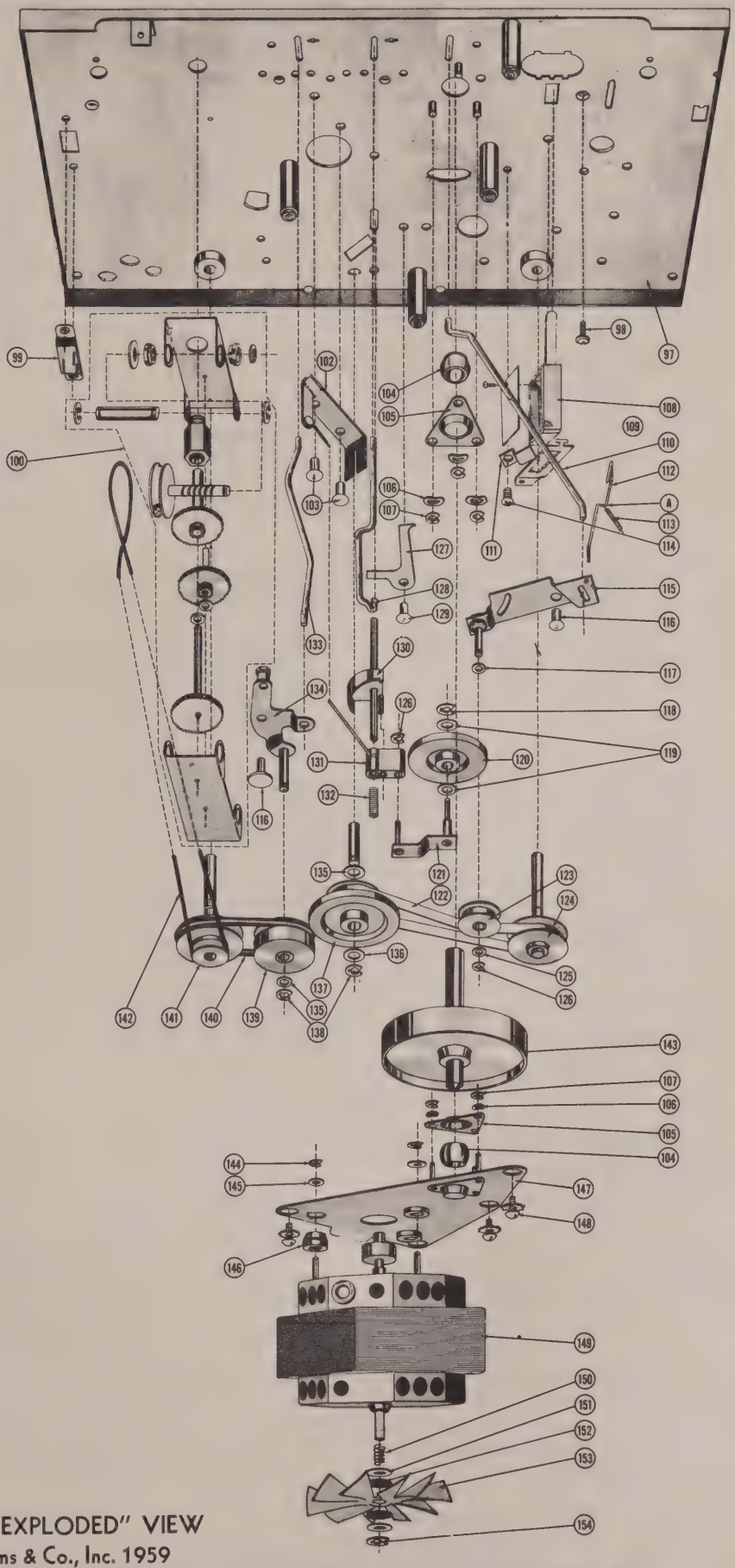

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FIG. 7B EXPLODED VIEW OF PARTS BELOW BASEPLATE

	3. Button levers not adjusted properly.	3. Button levers (88) must be adjusted so pressure roller (53) applies from 2 1/2 to 3 1/2 lbs. pressure on capstan in play or record position. See "Mechanical Adjustments".
	4. Pressure roller (53) not aligned properly.	4. See "Mechanical Adjustments".
Supply Reel does not revolve in rewind position.	1. Loose reel shaft screw (1).	1. Tighten.
	2. "O" Ring (140) off drive pulleys.	2. Replace.
	3. Rewind torque not sufficient.	3. See "Mechanical Adjustments".
	4. Activating spring (21) loose.	4. Replace.
	5. Take-up driver (137) not engaging motor drive shaft.	5. See ("Take-up Reel does not revolve in Play or Record Position").
	6. Brake sticking on take-up pulley.	6. Check that brake arm assembly is free and not binding, also check that brake return springs are releasing brakes.
	7. Pause Brake on.	7. Release.
	8. Oil on "O" Ring (140).	8. Remove all oil from "O" Ring and pulleys.
Does not shut off at the end of tape.	1. Defective switch.	1. Replace or repair.
	2. Switch wand catching on plastic escutcheon (13).	2. Position switch by loosening self-tapping screw (98).
Wow or Flutter (Record or Play back).	1. Bump on take-up belt (122).	1. Replace.
	2. Safety Switch (108) applying too much pressure on tape.	2. Replace.
	3. Brakes dragging.	3. (A) Adjust stop button lever (88) so brakes release completely. (B) Check that brake return springs (17) not loose or broken. (C) Brake arm assembly must be free and not binding. (D) Pause brake must release completely.
	4. Flat or bumpy pressure roller.	4. Replace.
	5. Capstan bearings not aligned properly.	5. Tap capstan slightly (bearings are self-aligning).
	6. Eccentric Flywheel.	6. Replace.
	7. Bumpy or eccentric capstan idler (120).	7. Replace.

	8. Head bar bracket loose.	8. (See "Take-up Reel revolves fast in Play or Record position").
	9. Pressure roller (53) not aligned properly.	9. See "Mechanical Adjustments".
Unit does not turn on with Off-On Switch.	1. No current at motor or amplifier.	1. (A) Check that current is reaching AC leads. (B) Check that fuse is not burned out. If so, replace. (C) Check that Off-On switch and automatic shut-off switch are closing.
Button Interlock (87) inoperative.	1. Interlock bar return spring loose or broken.	1. Replace.
	2. Buttons sheered.	2. Replace.
	3. Tabs on interlock bar (87) bent.	3. Straighten or replace. Tab on back of interlock bar must be set so the button lever on the stop button can remove the interlock bar from under the play and record button.
Record Button can be depressed without safety lever.	1. Record interlock return spring off or broken.	1. Replace.
	2. Tabs on record button interlock lever bent or broken.	2. Straighten or replace.
	3. Button sheered.	2. Replace.
Buttons do not stay depressed.	1. Latch bar spring off or broken.	1. Replace.
	2. Latch bar sticking or bent.	2. Repair or replace.
Counter inoperative.	1. Counter belt (142) off pulleys.	1. Replace.
	2. Counter dial loose.	2. Repair or replace.
	3. Gears binding.	3. Counter must turn freely without binding. Check gears and pulleys for binding.
Does not erase clean.	1. Leads off Erase Head (37).	1. Replace.
	2. Erase Head (34) not adjusted properly.	2. Erase Head should be adjusted so the top of the head pole piece is approximately .005 inch above the edge of the tape.
	3. Low erase current.	3. To determine the proper erase current, place a 10 ohm precision resistor in series with either lead leading from the erase head. Place the recorder in the record position and, using an A.C. Voltmeter, check the voltage across the resistor. With the oscillator and erase head functioning properly, the voltage across the resistor should be approximately .3 volts. With a .3 volt reading the required 30 milliamps of current is present.

Pause Brake does not operate properly.	1. Tab on pause brake not adjusted properly.	1. (See "Take-up Reel revolves fast when Play or Record buttons are depressed").
	2. Brake worn.	2. Replace.
	3. Brake return spring off or broken.	3. Replace.

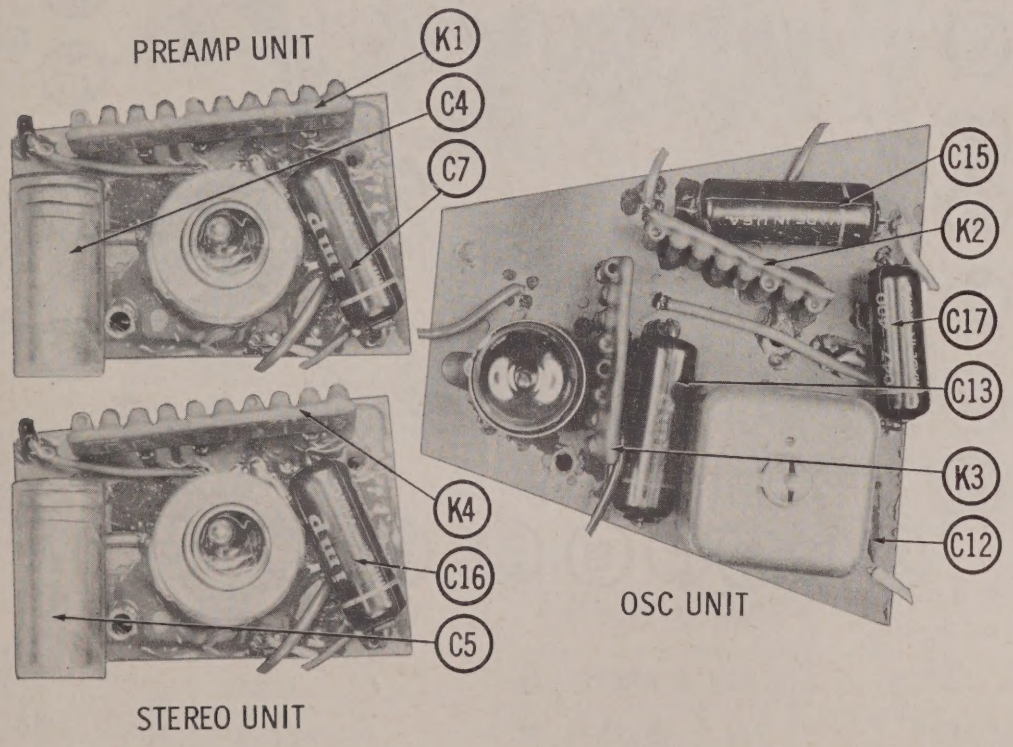
MECHANICAL PARTS LIST

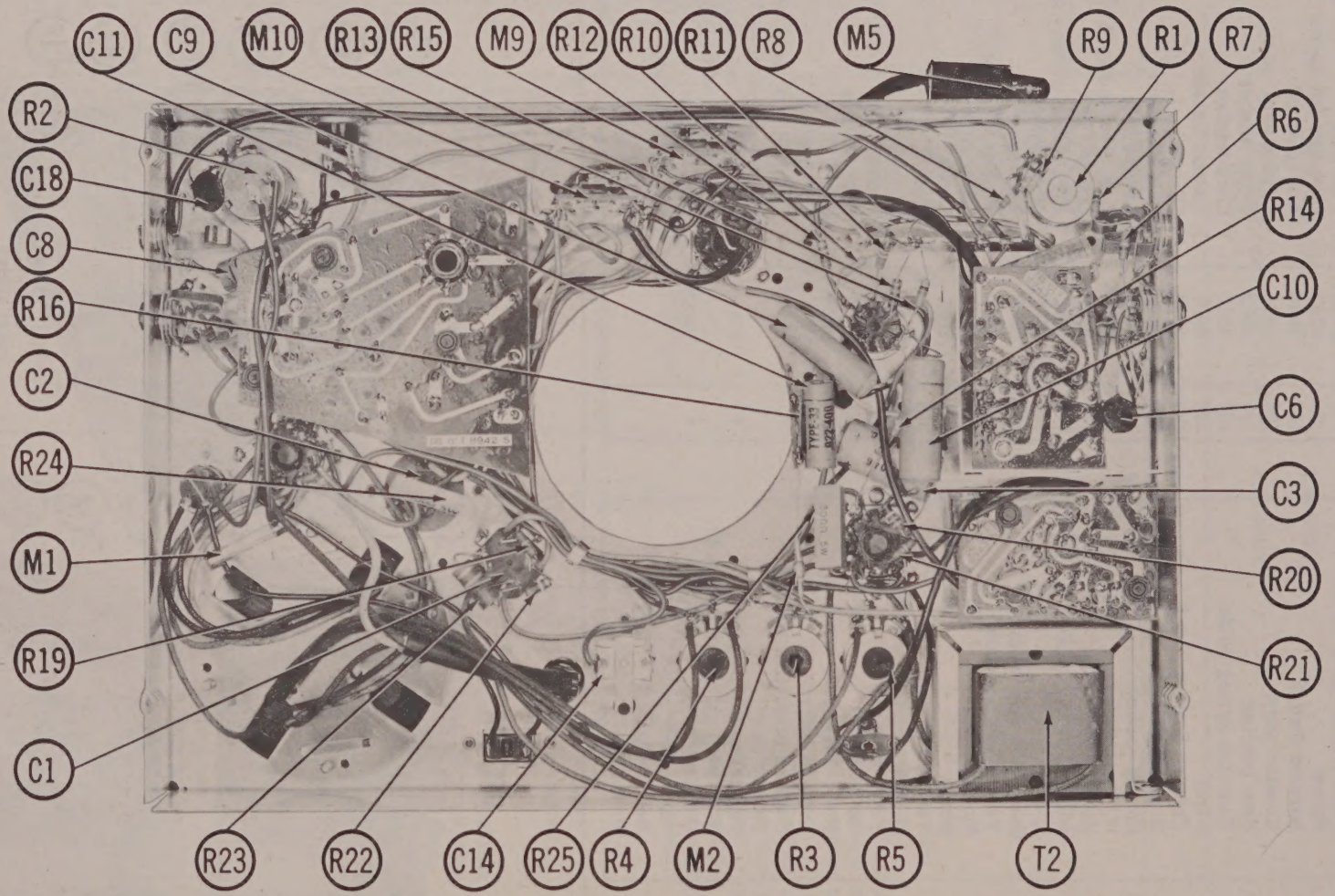
Ref. No.	Part No.	Description
1	8571	Reel screw (Left Hand)
2	8570	Reel screw (Right Hand)
3	8010-CD	Reel disc assy.
4	8140-A51	Speed knob
5	8256	Screw
6	8118-B	Head escutcheon (Model 750-8118C)
7	8853-A	Knob, Brilliance (Model 750-8853-B)
	8854-A	Knob, Bass
	8852-A	Knob, Volume (Model 750-8852-B)
8	6990	Felt washer
9	8407	Screw
10	15637-A	Counter Dial (Small)
12	15636-A	Counter Dial (Large)
13	8939-B	Main escutcheon (Model 750-8939-C)
14	8214	Tri Mount stud
15	15547	Cover Plate (Model 750-8361-CR)
16	8296	Screw
17	8138	Brake Arm Spring
18	8297	Brake Arm Assy.
19	8567	Shoulder Rivet
20	S8181	Takeup arm assy.
21	8441	Brake Activating Spring
22	8199	Fibre washer
23	8037	Rivet
24	8293	Safety Switch release lever
25	8294	Release wire
26	8048-A52	Pause button
27	8178	Pause brake shoe assy.
28	8017	Pause activating spring
29	4092	Rivet
30	8044	Pause lever
31	8078	Spring (Idler return)
32	8152	Screw (head bar bracket)
33	8147	Head bar bracket
34	8138	Spring
35	8520	Spring washer
36	8597	Head bar & plate assy.
37	12531	Erase head
38	12562	Record play head
39	12561	Binaural head (Model 711A)-(Model 714-750A-12548)
40	2300	Hex nut
41	8424	Washer
42	2300	Hex nut
43	2300	Hex nut (Not used in 710A)
44	2300	Hex nut
45	2300	Hex nut
46	2300	Hex nut (Not used in 710A)
47	8131	Spring (Head nest)

Ref. No.	Part No.	Description
48	8023	Head nest
49	8045	Tape guide
50	8175	Screw
51	8489	"E" Ring
52	8266	Fibre washer
53	8123	Pressure roller
54	1588	"C" washer
55	15716	Pressure pad spring
56	8393	Erase Pressure pad assy.
57	8928	Record Pressure pad assy.
58	1588	"C" washer
59	15716	Pressure pad spring (Not used in 710A)
60	8928	Pressure pad assy. (Not used in 710A)
61	8930	Felt pressure pad (record)
62	8048-A52	Monitor button
63	2857	Rivet
64	8398	Pal nut
65	6515	Washer
66	1652	"C" Washer
67	2853	Fibre washer
68	8298	Pal nut
69	8298	Screw
70	8173	Activating spring
71	8934	Activating spring
72	8285	Activating hook
73	8174	Activating spring
74	8173	Activating spring
75	8307	Safety switch shield
76	8608	Screw
77	8050	Tape stud
78	8434	Spring
79	8031	Dust shield felt
80	2274	Washer
81	8978	Control button housing assy. complete
82	8074-A51	Push button (dark grey)
	8074-A10	Push button (red)
83	8082	Latch bar
84	8037	Rivet
85	8432	Interlock lever
86	8128	Spring
87	8114	Lock bar
88	8024	Button lever
89	8256	Screw
90	8382	Button housing assy. (Includes 8037, 8432, & 8114)
91	8089	Button lever rod
92	1652	"C" washer
93	1588	"C" washer
94	8116	Stop rod
95	8125	Spring

Ref. No.	Part No.	Description
96	8128	Spring
97	15624	Baseplate assy. (Includes all parts permanently fixed)
98	8298	Screw
99	8220	Monitor Switch
100	8046	Counter assy.
101	S8006	Reel bearing
102	S8076	Cam link spring guide
103	2857	Rivet
104	8084	Capstan bearing
105	15522	Bearing plate
106	8133	Spring washer
107	1588	"C" washer
108	8038	Safety switch assy.
109	8090	Safety switch bracket
110	8121	Rod
111	8107	Guide (Forward rod)
112	8326	Takeup bar actuator
113	8130	Spring
114	8298	Screw
115	S8377	Takeup bar assy.
116	8331	Shoulder rivet
117	2829	Fibre washer
118	8488	"E" Ring
119	2829	Fibre washer
120	8079	Capstan idler
121	S8391	Capstan pivot arm
122	8034	Takeup belt
123	8103	Tension pulley
124	8182	R. H. reel pulley & shaft assy.
125	8568	Cork washer
126	8488	"E" washer
127	8014	Bell crank
128	8009	Brake rod

Ref. No.	Part No.	Description
129	8037	Rivet
130	8039	Cam & shaft assy.
131	S8029	Cam link
132	8535	Cam link lift spring
133	8035	Rod (rewind)
134	8973	Rewind arm assy.
135	2583	Fibre washer
136	8566	Cork washer
137	8018	Takeup Driver
138	8489	"E" ring
139	8106	Rewind driver
140	8063	Rewind belt
141	8183	L. H. reel pulley & shaft assy.
142	8141	Counter belt
143	8110	Flywheel & capstan assy.
144	1652	"C" washer
145	8373	Washer
146	8060	Grommet (rubber)
147	8378	Sub plate assy.
148	8146	Screw
149	8015	Motor
150	8258	Spring
151	2279	Washer
152	7470	Cork washer
153	8255	Fan
154	1719	"C" washer
*	15550	Tape release wire (Mounted between erase & record heads)
*	15559	Takeup arm release spring (secured by right brake stop shoe)
*	15689	Guide (Belt)
		*Parts not shown in exploded views.





AMPLIFIER CHASSIS - BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Preamplifier	12AX7/ECC83
V2	AF Amplifier	12AX7/ECC83
V3	Record Level Indicator	6E5
V4	Bias Oscillator	12AU7A
V5	Stereo Preamp.	12AX7/ECC83 ①
V6	Output	6V6GT
V7	Rectifier	5Y3GT

① Not used in Model 710A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	450	12044	AFH1-52	A0480	FP146	TMS-57	S-270	TVL-1725
C2A	▲40	450	12045	AFH4-18-10	D0171	FP446	TMQ-18	Q-060	TVL-4771.8
B	10	450					TD-10-450	MT-4510	
C	▲10	450							
D	■30	450							
C3	10	25	12046	PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204
C4	50	6	12061	SRE6V50	BBR50-6	TT6X50	TD-50-6	MMT-650	TVA-1100
C5	50	6	12061 ①	SRE6V50	BBR50-6	TT6X50	TD-50-6	MMT-650	TVA-1100

① Not used in Model 710A.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	1000		12040-10	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C7	.047	400	12033	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	.022	400	12037	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C9	.047	400	12033	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.1	400	12008	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C11	.022	400	12037	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C12	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C13	.1	400	12008	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C14	40-200		12077						
C15	.1	400	12008	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C16	.047	400	12033	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	①
C17	.047	400	12033	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	2000		12068	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C19	2	100	12069						

① Not used in Model 710A

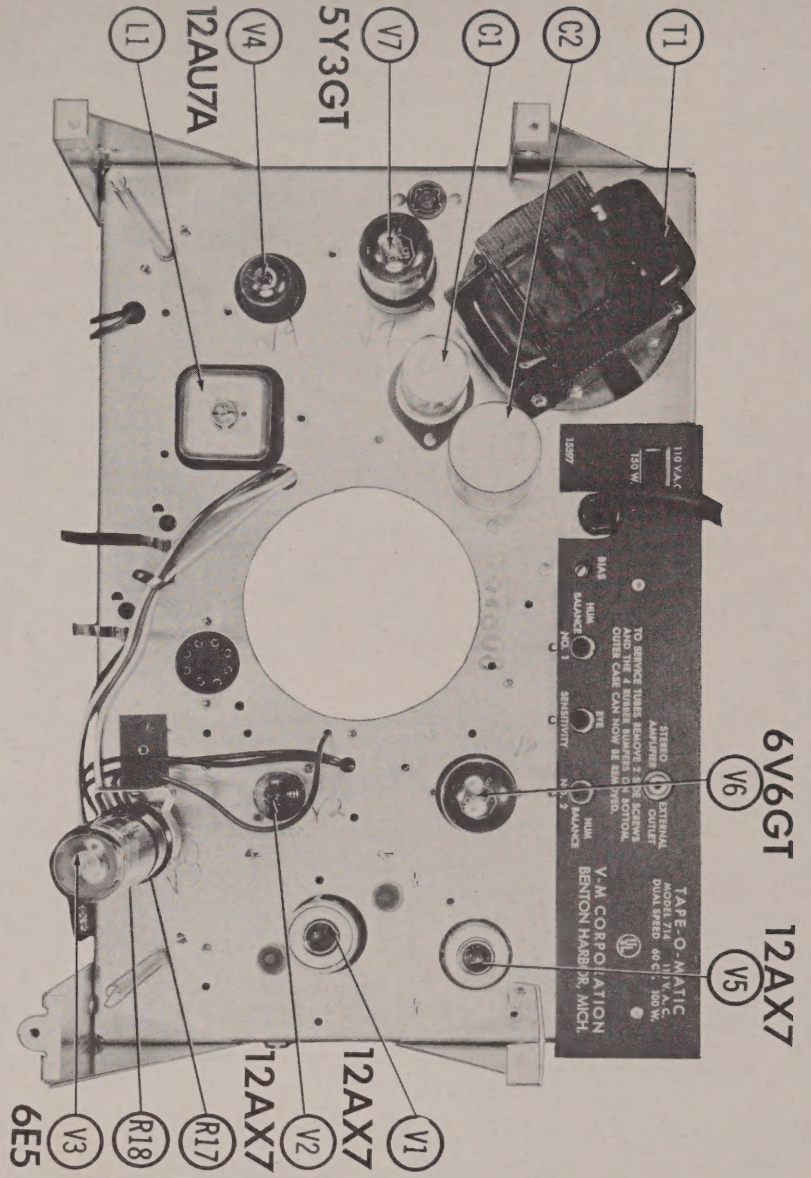
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	200K	½	12346	AB-51		Q13-129	U44	Volume
B	Shaft			AK-10		C3 †	DS36 ††	
R2A	500K	½	12344				■ UE3843S	Bass
B	50K	½						Treble, Power Off-On Switch
R3A	500K	½	12349	AB-60	B47-500K-Z	B13-133	TA55A	Indicator Sensitivity
B	Shaft			AK-1	Not Req.	TM1	Not Req.	
R4A	200Ω	½	12345	AB-2		B11-201		Hum Balance #1 Note 1
B	Shaft			AK-1		TM1		
R5A	200Ω	½	12345	AB-2		B11-201		Hum Balance #2
B	Shaft			AK-1		TM1		

† Shaft Coupler †† Extension Shaft Note L Not used in Model 710A

■ "STA-LOC" Equivalent: FB55A, OS5250, RU54A, IS5770, US-41

AMP CHASSIS—TOP VIEW



AMP PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	NOTES
R6	15K		11013	
R7	1meg		11453	
R8	220K		11293-10	
R9	10K		10973-10	
R10	220K		11293-10	
R11	3300Ω		10853-10	
R12	100K		11213-10	
R13	1meg		11453	
R14	120K		11233-10	
R15	1500Ω		10773-10	
R16	4.7meg		11613	
R17	1meg		11453	
R18	100K		11213-10	
R19	22K		11053	①
R20	330K		11333	
R21	22K		11053	
R22	100K		11213-10	
R23	10K	2	10975-10	
R24	500Ω	5(WW)	11963	
R25	300Ω	5(WW)	11948	

① Some versions use 100K in this application (Part #11213-10)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA V-M PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	12557					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .57A	720VCT ② .060A	5VAC ② 1.8A	12558-1 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ② 1.3A	6.3VAC ② 1A								

① Used in Models 714, 750A, 711A. Model 710A used Part #12522.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5300Ω	30Ω Tap ② 8Ω	12559-1 ①	Z1006 ②	A-2902 ②	AU-600 ②	A-3849 ②	24S64 ②	S-55Z ②	① Used in Models 714, 710A, 711A. Model 750A uses Part #12521. ② Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA V-M PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	6-8Ω	8958-2 ①	69A3Z8	① Used in Models 714, 710A, 711A
SP2	3½"	PM	14Ω	8959-4 ①	3A15T	② Two used, Model 750A
	8"	PM	3-4Ω	7129 ②	8A10Z3.2	③ Used in Model 750A
	3½"	PM	14Ω	8440 ③	3A15T	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA V-M PART No. FUSE	V-M PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	GJV	3A 250V	8635		318003. (3A 250V)		GJV3	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA V-M PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N34A	17001	1N34A	1N34A	Level Rect. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Erase Head	12531	
M4	Record-Playhead	12562	
	Binaural Head	12561	Model 711A
	Binaural Head	12548	Model 714, 750A
M5	Lamp	4654	#47
M6	Switch	8220	Monitor
M7	Switch	8038	Safety
M8	Switch	8786	Stacked/Staggered, Record Play, Models 714, 750A
M9	Switch Assembly	8120	Playback
M10	Switch Assembly	8119	Record
	Printed Board	8942	Osc.
	Printed Board	8943	Preamp., Two used in Models 711A, 714, 750A
M11	Motor	8015	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	V-M PART No.	REPLACEMENT DATA
K1	Preamp. Circuit	10000mmf, 560mmf, 2.2meg, 2200Ω, 1meg, 10meg, 180K, 220K, 100K	12564	
K2	Record Circuit	470mmf, 180mmf, 10000mmf, 47K, 100K, 220K, 47K, 100K	12563	
K3	Oscillator Circuit	200mmf, 1000mmf, 2000mmf, 1000mmf, 100K, 100K, 100K, 100K	12565	
K4	Stereo Preamp. Circuit	10000mmf, 560mmf, 2.2meg, 2200Ω, 1meg, 10meg, 180K, 220K, 100K	12564	①

① Not used in Model 710A

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8140-A51	Speed
Knob	8853-A	Brilliance, Model 750 8118C
Knob	8854-A	Bass
Knob	8852-A	Volume, Model 750 8852-B
Pushbutton	8048-A52	Pause, Monitor, Two used
Pushbutton	8074-A51	Dark Grey
Pushbutton	8074-A10	Red
Belt	8063	Rewind

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)